RX PRINTER

OPERATION MANUAL

EPSON

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RX PRINTER

OPERATION MANUAL

EPSON

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WARNING

High voltage exists inside this unit and the case should be opened only by a service person!

INTRODUCTION

The new EPSON RX-80 and RX-80 F/T Dot Matrix Printers, featuring an 8K-byte ROM, adopt proven EPSON MX series technologies combined with several new functions to take the lead in moderately priced, high cost-performance printing and promise even greater efficiency for the user's present system. Ideal for both business and personal computing applications, the RX printer guarantees the same reliability and versatility that have made the EPSON MX series the world's best-selling printers.

The RX-80 printer accommodates pin-feed paper from 4" to 10" in width. RX-80 F/T printer also accommodates pin-feed paper (4" to 10"). By using friction feed, the RX-80 F/T can be used with cut sheets (8.3" to 8.5" by 12" max.) and 8.5" roll paper (provided the optional roll paper holder is employed).

The RX printer boasts versatile printing capability with two full 96 ASCII character sets plus 11 international character sets and 32 graphic characters. 128 different types of characters can be output in various print modes including Emphasized, Double-strike, Elite-sized and Alternate (italic), with simple and easy programming.

Programming international character sets (U.S.A., France, Germany, England, Denmark I, Denmark II, Sweden, Italy, Spain, Japan and Norway) can also be performed quickly with minimal effort. Thanks to user-defined left and right margins, texts and data can be laid out freely. In addition, all the graphics and characters of the EPSON HX-20 portable computer can be output on the RX printer.

The RX printer's fast print speed of 100 cps ensures high throughput to provide maximum productivity. For a quiet office environment, half-speed mode (50 cps) is programmably selectable to lower print noise by 3 dB.

The possibility of hard-copy output production has been vastly expanded owing to the 6 different bit image modes of the RX printer. These include 1,920 dots per 8-inch quadruple density, 640 dots per 8-inch CRT graphics I, and 720 dots per 8-inch CRT graphics II. These modes can be programmably used in the same print line in any combination.

When you add together the cost-performance, functions and versatility, there's no other printer to match the RX printer throughout the world. The name to always remember in digital printers is EPSON. Anything else is second best.

Chapter 1 SET-UP

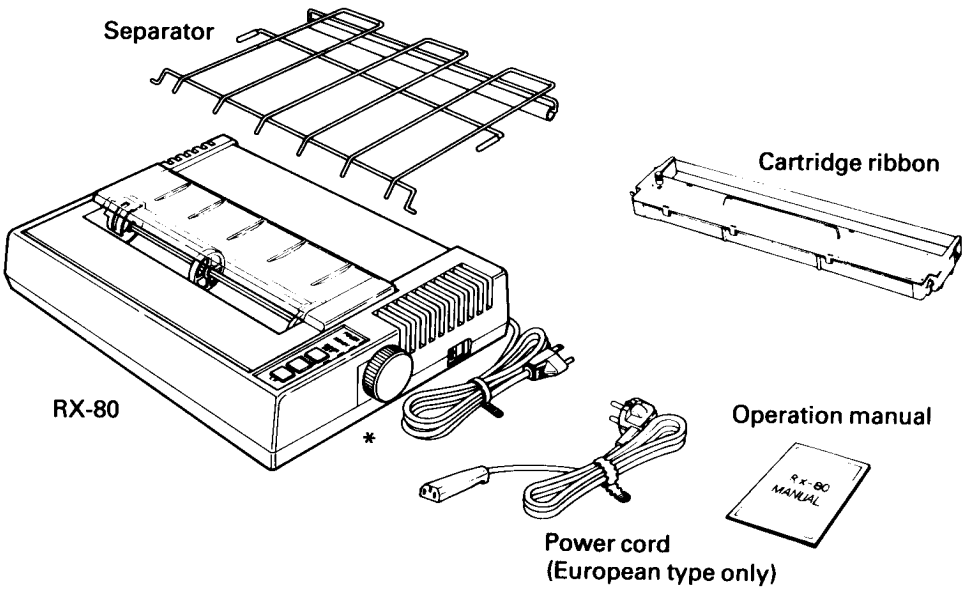
1.1 Unpacking Steps

1. Open the carton.
2. Grasp the RX printer by its underside and lift straight out with packing material attached.
3. Place the printer on a flat surface.
4. Carefully remove packing material.
5. Remove the vinyl cover.

1.2 Counting the Parts

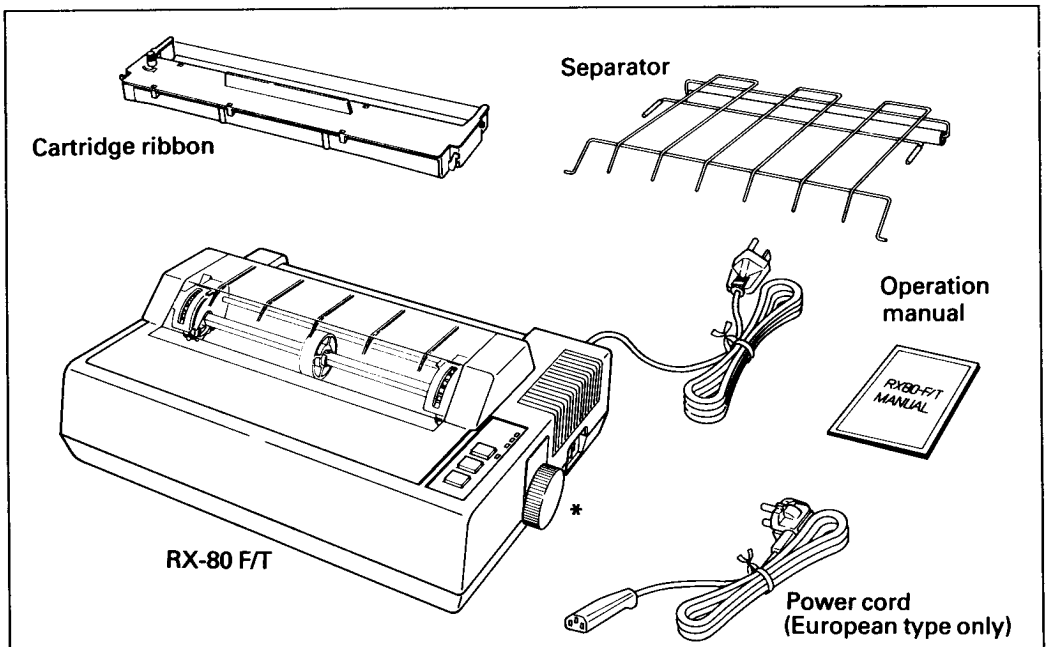
Check the box for evidence of shipping damage or mishandling. If such evidence is present, contact the store where you purchased the printer as soon as possible.

The RX-80/RX-80 F/T and standard accessories are as shown below.



* The manual paper feed knob is not attached to the printer when it is shipped.
Fit the manual paper feed knob by pushing it straight in, with firm but steady pressure.

Contents of Carton (RX-80)



* The manual paper feed knob is not attached to the printer when it is shipped.
Fit the manual paper feed knob by pushing it straight in, with firm but steady pressure.

Contents of Carton (RX-80 F/T)

NOTE:
EPSON dealers provide a cable to connect the printer to your particular computer. Computers that do not use the Centronics™ standard parallel interface scheme need a special interfacing kit. EPSON dealers can supply kits for many popular computers.

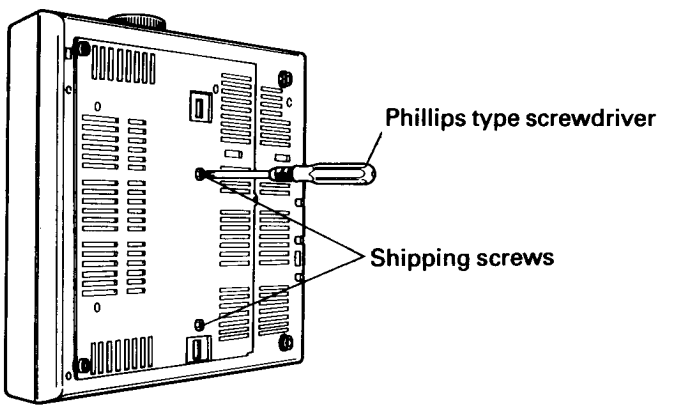
1.3 Removal of Protective Paper

The RX printer is provided with a protective paper inserted between the inner and outer paper guides to protect the paper end detector from damage due to shocks or vibrations during transportation. Before using the printer, be sure to remove this paper. If the RX printer is to be reshipped, remember to return the paper to the original position.

1.4 Removal of Shipping Screws

The purpose of the shipping screws is to protect the RX printer against any damage that may be caused by shocks or vibrations during transportation. Therefore, before operating the printer, remove the screws as described below.

1. Remove the printer cover to protect it from damage before removing the shipping screws. For details of removing the printer cover, see page 1-5.
2. Stand the printer on its left side.
3. Remove with a screwdriver the two shipping screws visible on the underside of the lower case.



Removal of Shipping Screws

<Repacking Steps>

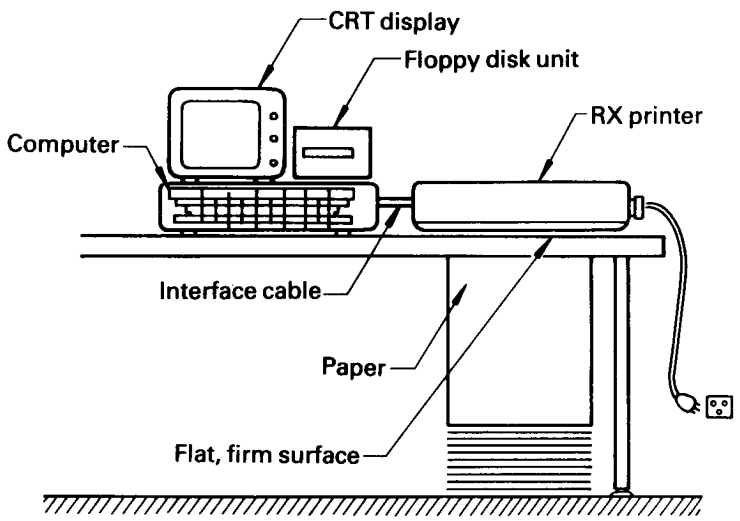
Repacking can be carried out by following the above steps in the reverse order. (Repacking: Shipment for repair, storage, etc.)

NOTE:

It is recommended that all original packing materials be saved for reuse in case the RX printer requires reshipment in the future.

1.5 Operation Site Selection

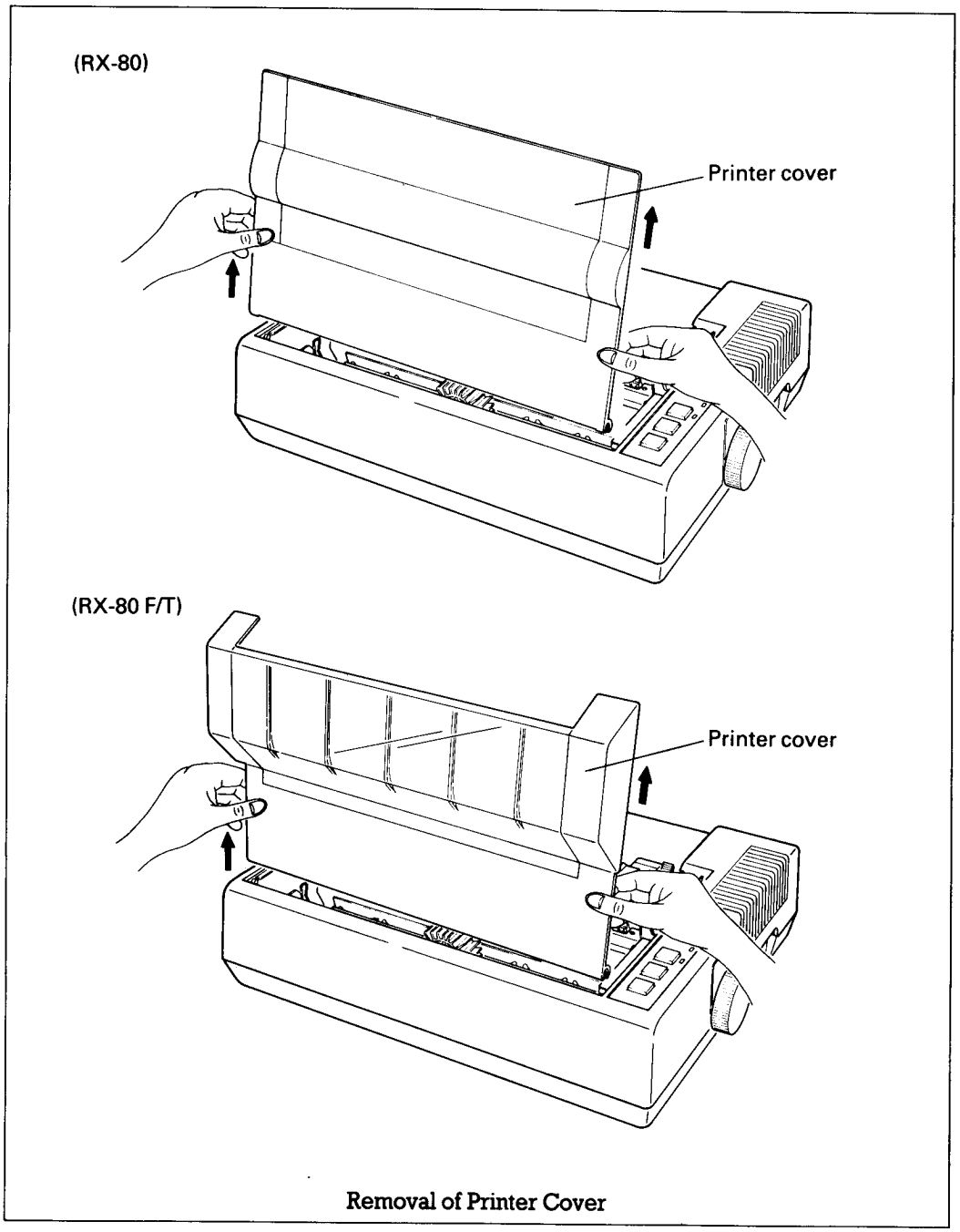
1. The RX printer should be installed on a flat, firm surface with enough room as shown below.
2. Care should be exercised in locating the printer in areas where it will not be exposed to direct sunlight or where the environment contains grease or dust.
3. The printer should not be located in the vicinity of noise generating equipment or heat generating equipment.
4. Do not subject the printer to temperatures below 5°C (41°F) or above 35°C (95°F) during operation. Also avoid sudden changes in temperature and extreme shock.



Laying Printer on Flat, Firm Surface

1.6 Cartridge Ribbon Setting

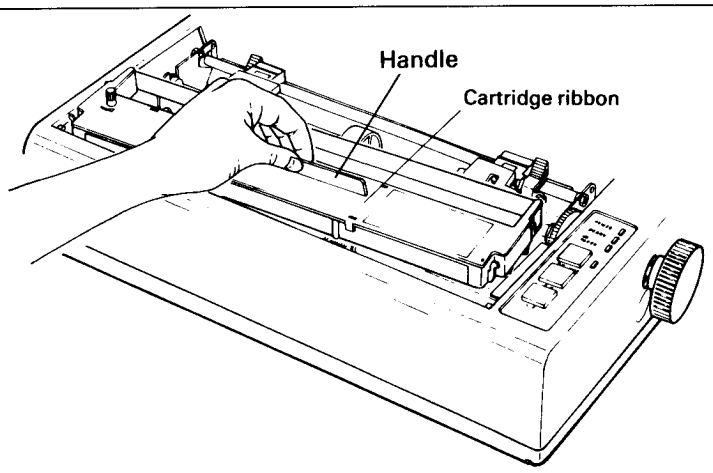
To set the cartridge ribbon more easily, and to reduce the risk of damaging the printer cover, remove the cover before setting the cartridge ribbon.

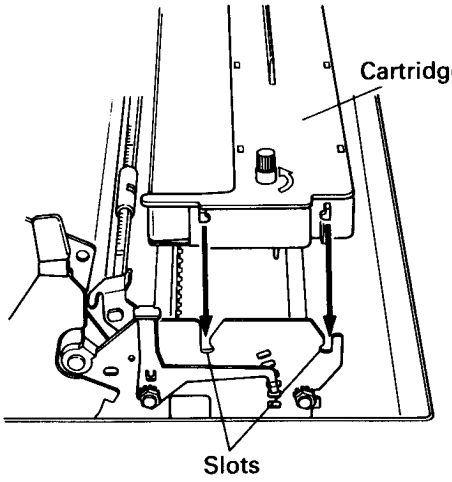


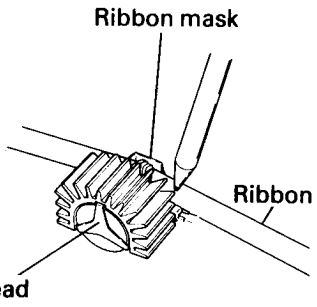
Removal of Printer Cover

Unless otherwise specified, the procedures described below are applicable to both the RX-80 and RX-80 F/T.

1. Take the cartridge ribbon from the box.
2. Confirm that the scale is turned toward the platen.
3. Push the cartridge ribbon down and set it on the printer mechanism. To facilitate the cartridge ribbon setting, be sure to hold the handle at the center of the cartridge case when pushing the cartridge ribbon down.



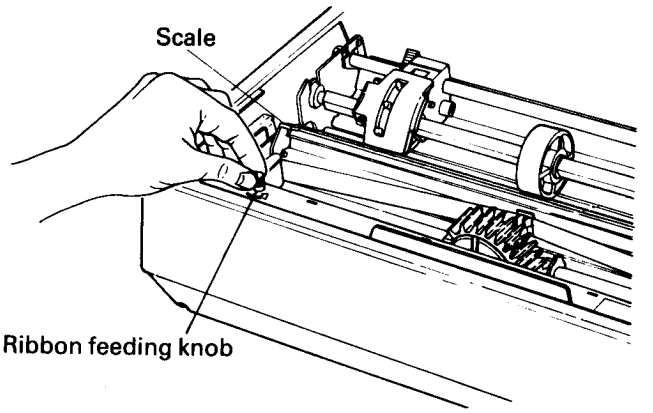




Cartridge Ribbon Setting (1)

4. Put the ribbon between the head nose and the ribbon mask. In this case, the ribbon can be set easily by hooking it to the edge of the head nose and turning the ribbon feeding knob of the cartridge case counterclockwise, while depressing the ribbon with a ball-point pen.

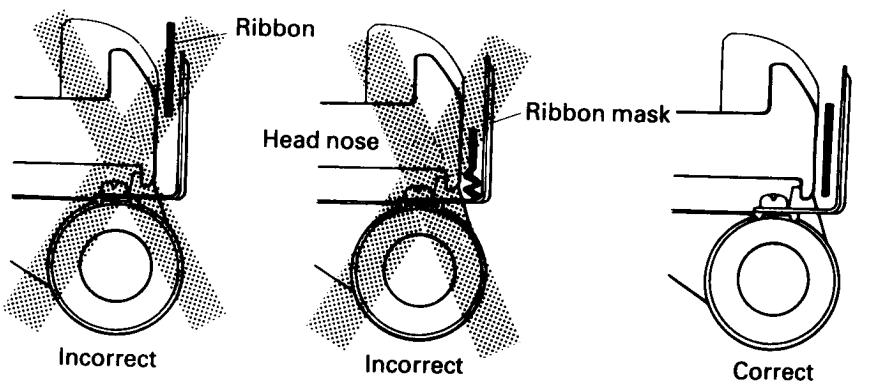
5. Tension the ribbon by turning the ribbon feeding knob counterclockwise.



Cartridge Ribbon Setting (2)

NOTES:

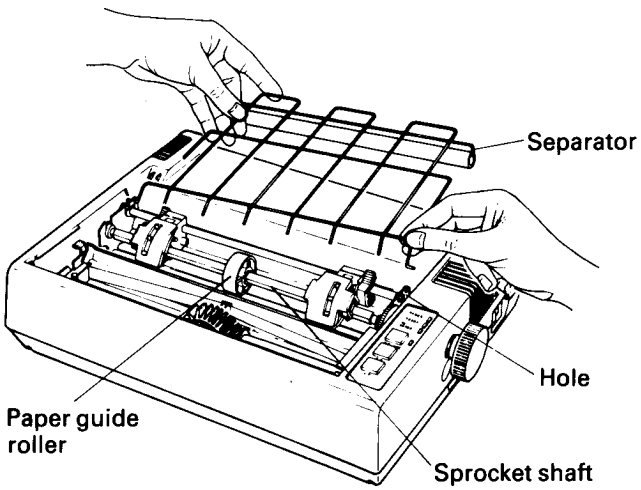
1. *Incorrect setting of the ribbon may cause it to come off.*
2. *Confirm that the ribbon is neither twisted nor creased and that the cartridge is set properly.*



Examples of Correct and Incorrect Ribbon Setting

1.7 Separator Installation

The separator of the printer contributes to smooth paper feeding. Set the separator by inserting its edge into the two holes located at the rear part of the frame of the printer mechanism.

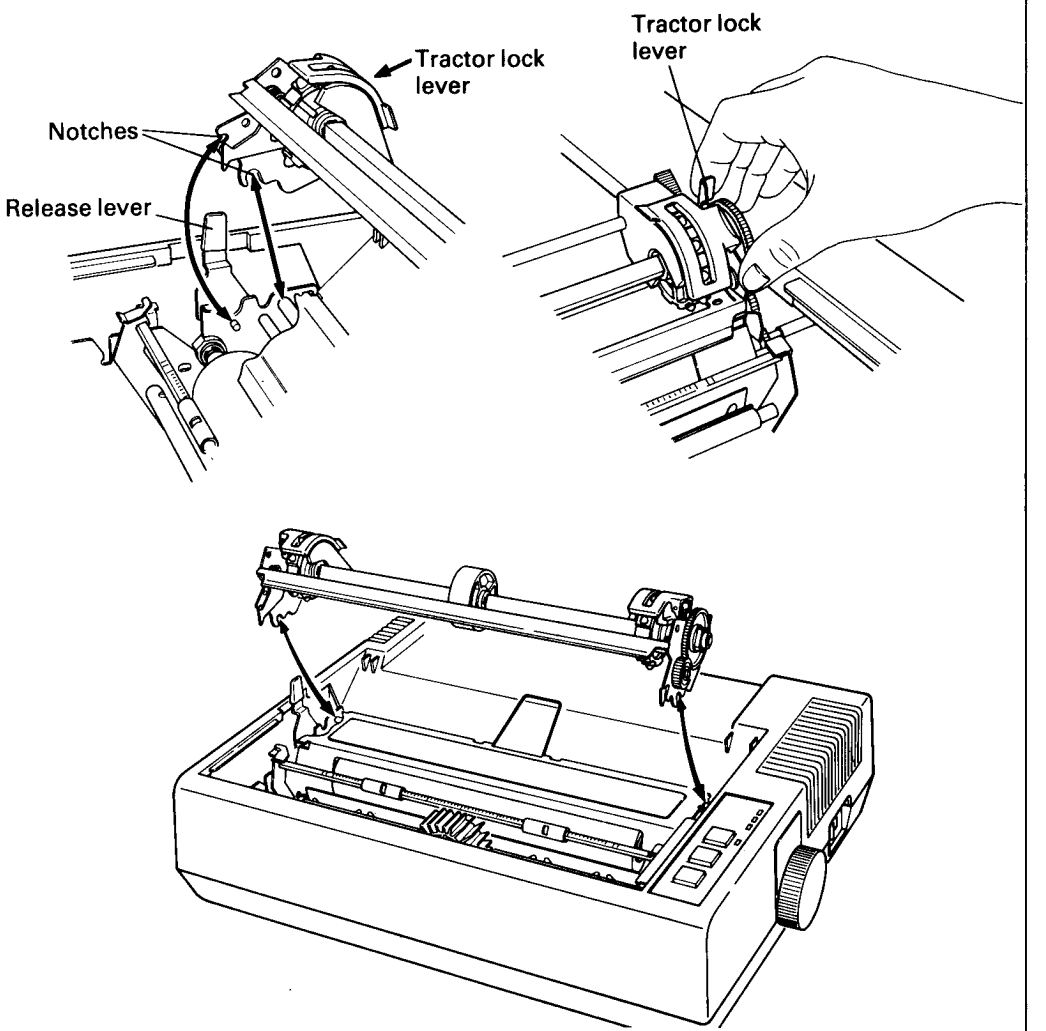


Separator Installation

1.8 Dismounting and Remounting the Tractor Unit (RX-80 F/T only)

The tractor unit of the RX-80 F/T is removable. To remove the tractor unit, follow the procedure listed below.

1. Raise the printer cover.
2. Unlock the notches of the tractor frame from the shaft while pulling the tractor lock levers at both ends of the tractor unit forward. Then remove the tractor unit by tilting it away from you.



Dismounting the Tractor Unit

To reattach the tractor unit, hook the notches of the tractor frame onto the shaft while pulling the tractor lock levers of the tractor unit forward.

1.9 Paper Loading

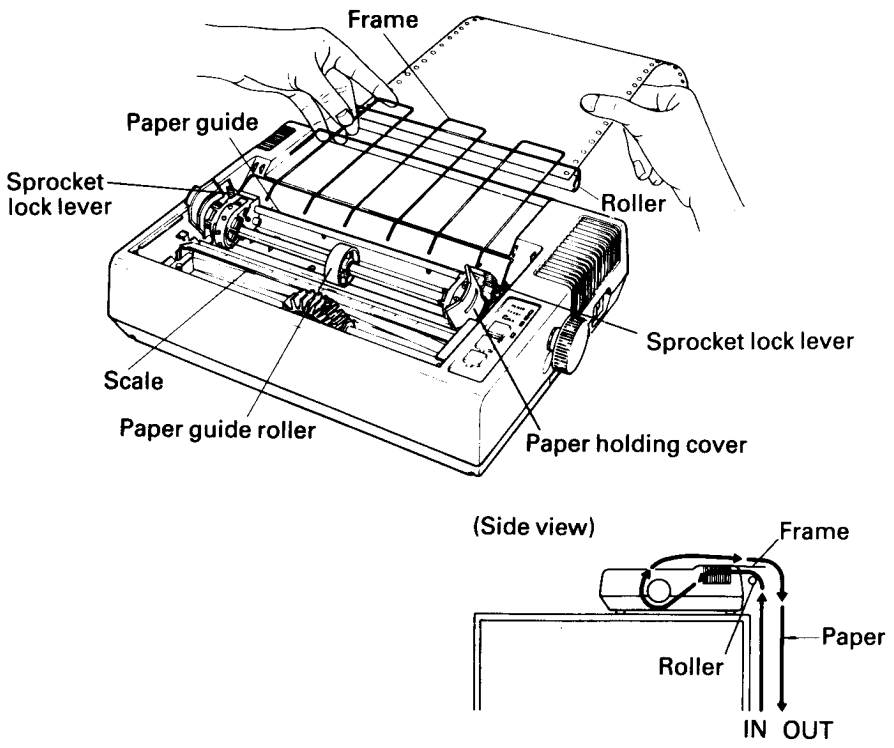
1.9.1 Pin-feed paper (with tractor feed)

FOR RX-80

(See page 1-13 for the RX-80 F/T.)

The RX-80 printer accommodates pin-feed paper from 4″ to 10″ in width. To load the pin-feed paper, observe the following procedure.

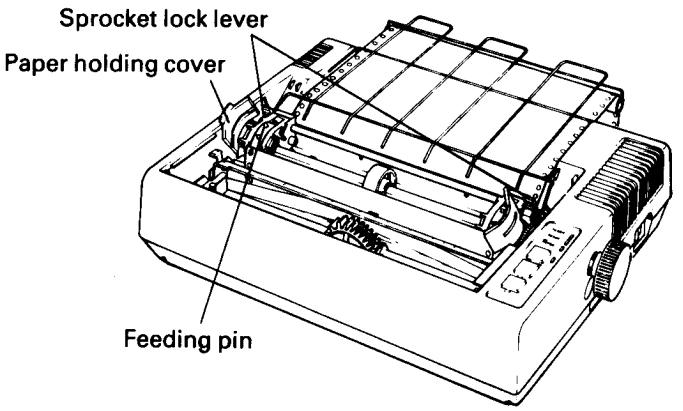
1. Raise the printer cover.
2. Raise the sprocket lock levers and widen the feeding pins to max. positions. Then open the paper holding covers.
3. Pull the scale toward the front of the printer to detach it from the platen.
4. Set the paper guide roller at the center of the sprocket shaft. This contributes to smooth paper feeding.
5. Be sure to insert the pin-feed paper between the frame and plastic roller of the separator.



Insertion of Pin-feed Paper

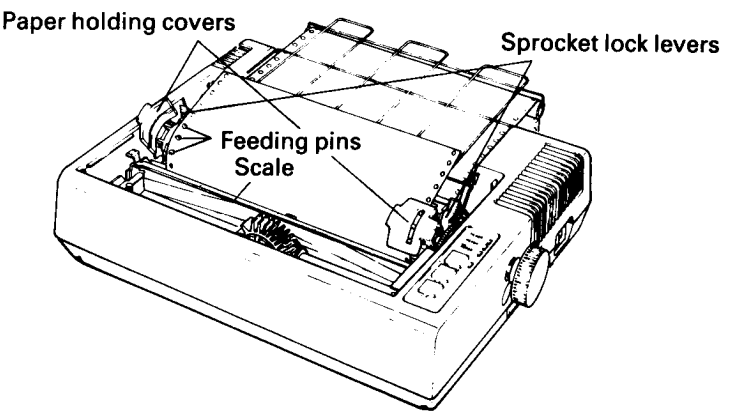
6. Push the paper into the insertion slot between the paper guides at the rear part of the printer mechanism.
   NOTE:
   Be sure to pass the paper beneath the upper paper guide.
7. After the leading edge of the paper has emerged from the printer, pull it out gently to some length.

8. Adjust the sprocket pin position to the paper width.



Raising of Sprocket Lock Levers

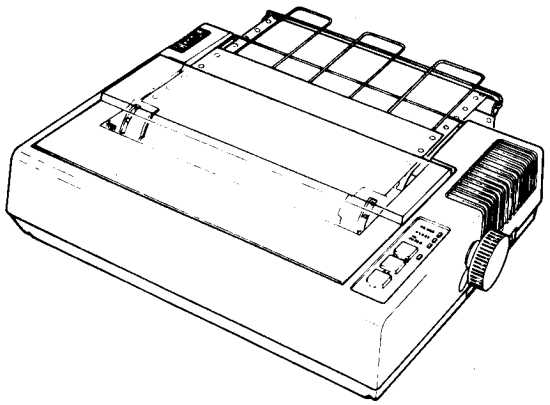
9. Engage the paper feed holes of the paper on the feeding pins, push the paper holding cover, and adjust the tension of the paper. Then push the two sprocket lock levers down.
   NOTE:
   In this case, confirm that the feeding pins are centered in the respective paper feed holes of the paper.



Engagement of Paper Feed Holes on Feeding Pins

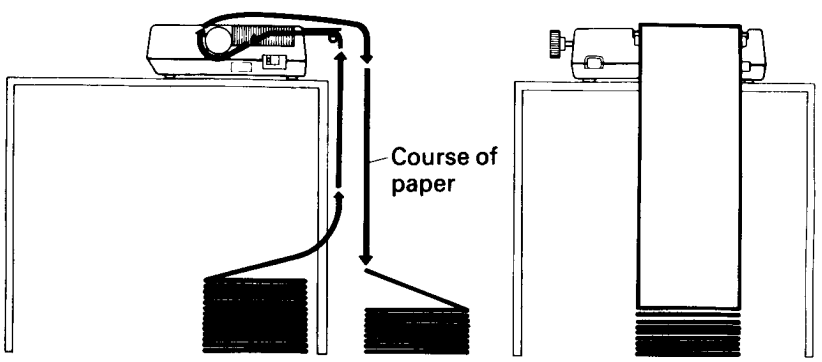
10. Push the scale back into position.

11. Put the printer cover on the printer.



Printer with Pin-feed Paper Set Completely

NOTE:
When the RX-80 is to be used on a desk or a bench, arrangement of the pin-feed paper in parallel with the RX-80 as shown below will permit the paper to be folded in an accordion style.



Example of Paper Arrangement

FOR RX-80 F/T

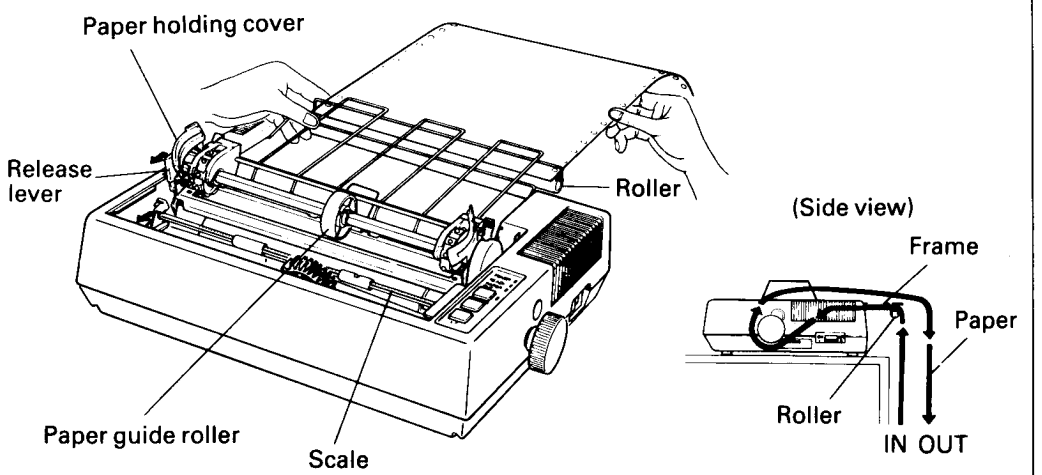
(See page 1-10 for the RX-80)

The RX-80 F/T printer accommodates pin-feed paper from 4″ to 10″ in width. To load the pin-feed paper, observe the following procedure.

NOTE:

Unlock the release lever to release the friction feed during tractor-feed operation.

1. Raise the printer cover.
2. Raise the sprocket lock levers and widen the feeding pins to max. positions. Then open the paper holding covers.
3. Pull the scale toward the front of the printer to detach it from the platen.
4. Unlock the release lever.
5. Set the paper guide roller at the center of the sprocket shaft. This contributes to smooth paper feeding.
6. Be sure to insert the pin-feed paper between the frame and plastic roller of the separator.



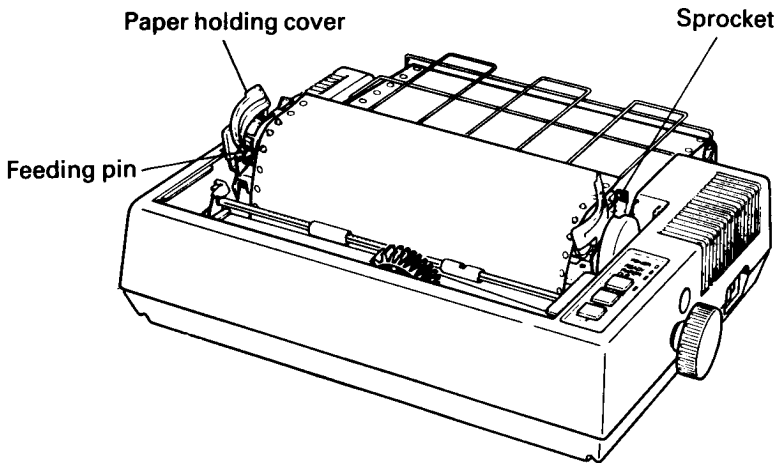
Insertion of Pin-feed Paper

7. Push the paper into the insertion slot between the paper guides at the rear part of the printer mechanism.

   NOTE:

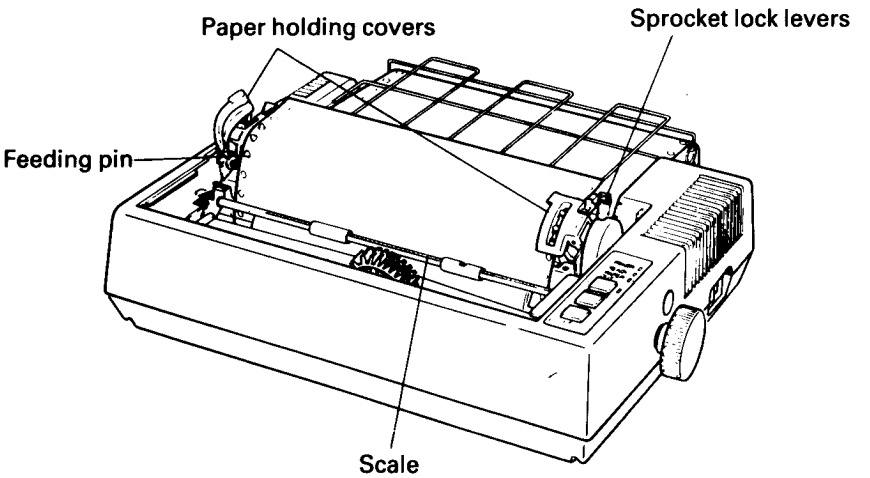
   Be sure to pass the paper beneath the upper paper guide.
8. Lock the release lever and advance the paper while turning the manual paper feed knob clockwise. Then unlock the release lever.

9. Adjust the sprocket pin position to the paper width.



Raising of Sprocket Lock Levers

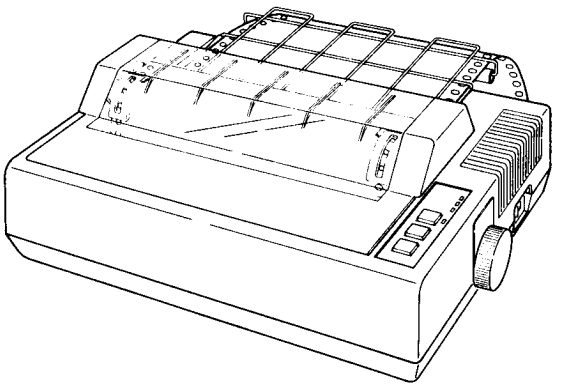
10. Engage the paper feed holes of the paper on the feeding pins, push the paper holding cover, and adjust the tension of the paper. Then push the two sprocket lock levers down.
NOTE:
In this case, confirm that the feeding pins are centered in the respective paper feed holes of the paper.



Engagement of Paper Feed Holes on Feeding Pins

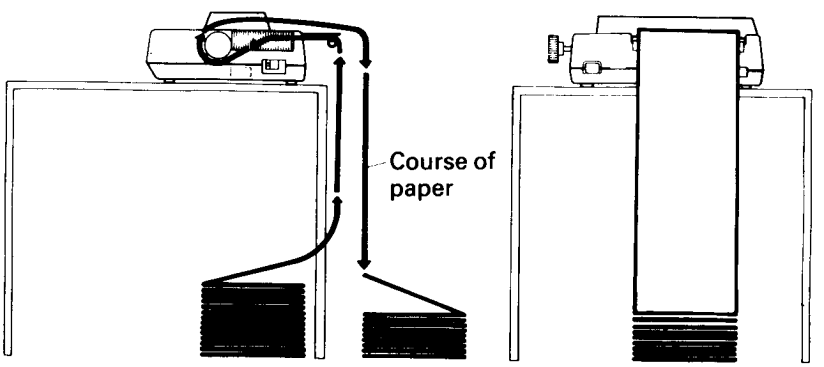
11. Push the scale back into position.

12. Put the printer cover on the printer.



Printer with Pin-feed Paper Set Completely

NOTE:
When the RX-80 F/T is to be used on a desk or a bench, arrangement of the pin-feed paper in parallel with the RX-80 F/T as shown below will permit the paper to be folded in an accordion style.



Example of Paper Arrangement

1.9.2 Removal of pin-feed paper

To remove the pin-feed paper, follow either of the two methods described below.

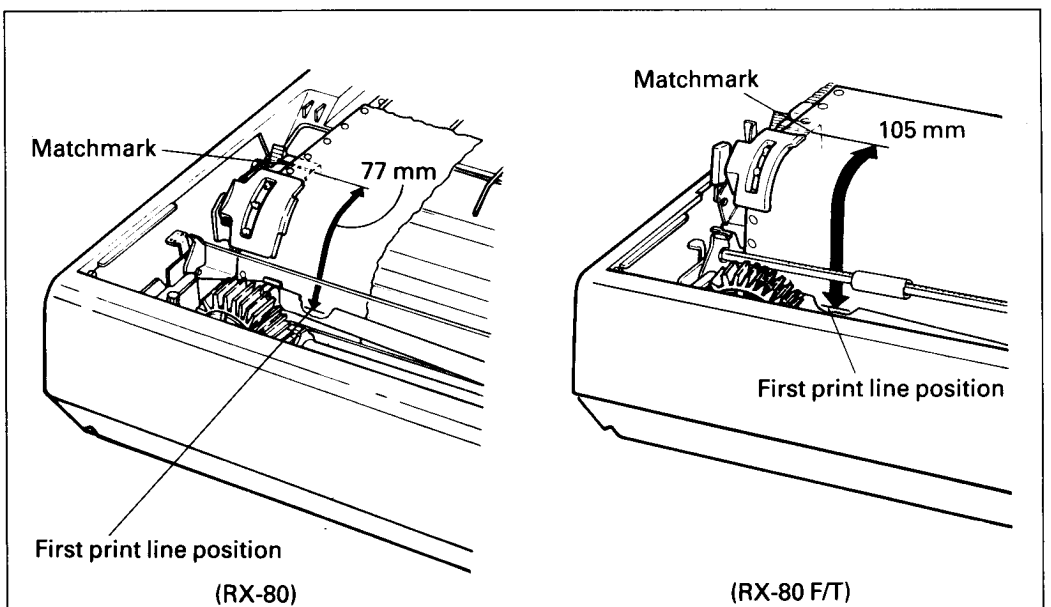
(1) To disengage the paper from the paper holding mechanism, pull it forward out of the printer.
NOTE:
Do not attempt to pull out the paper in the backward direction.
(2) Feed the paper out of the printer by pushing the Line Feed (LF) or Form Feed (FF) switch. At this time, the power switch of the printer must be set to the ON position and the printer must be in the OFF-LINE mode.

1.9.3 Column layout on pin-feed paper

When pin-feed paper of from 4″ to 10″ in width is supplied with the RX printer, the graduations on the scale can be used as the indexes of print column positions (1 to 80).
Alignment of the print start position on pin-feed paper with the 1st column position at the extreme left of the scale will facilitate column layout. Accordingly, center the paper by adjusting it to these indexes of the scale.

1.9.4 Top of form position setting

The term "Top of form position" is defined as the position in which the first print line lies on the form, and this position is determined when the power switch is turned on. Namely, adjust the paper position by the manual paper feed knob so that the required line position (i.e., the point at which the first line of the form is desired to be printed) is at the print head level. If, at this point, power is applied to the printer, this line position automatically becomes the Top of form position. When printing forms, the matchmarks located on both the sprockets facilitate the setting of the Top of form position on the fanfold paper. To set the Top of form position, first enter (or preprint) a mark at a position on the edge of the paper 77 mm (for RX-80) or 105 mm (for RX-80 F/T) above the first print line position of the paper, then align this mark with the matchmarks on the sprockets by turning the manual paper feed knob. At this point, turn the Power Switch on and the printer will recognize this position as the Top of form position. Now, the printing can be started from the Top of form position.
In case of feeding one page of pin-feed paper by operating the RX printer by the input of FF code, the abovementioned adjustment is effective.

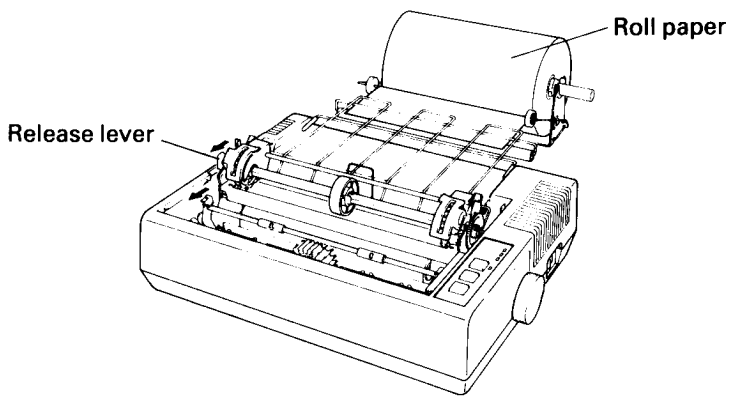


Top of Form Position Setting

1.9.5 Roll paper (with friction feed) (RX-80 F/T only)

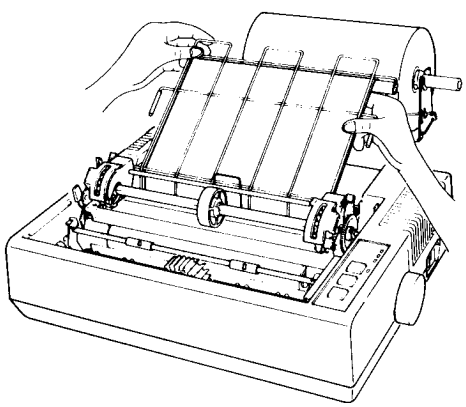
EPSON offers the roll paper holder as an option for the RX-80 F/T.
The RX-80 F/T accommodates a roll of single ply paper measuring 8.5" in width with a 1-inch core. To load the roll paper, observe the following procedure.

1. Raise the printer cover.
2. Raise the two sprocket levers to loosen and adjust the sprocket pin position at both ends of the sprocket shaft. Then lock the sprocket lever.
3. Pull the scale toward the front of the printer to detach the scale from the platen.
4. Unlock the release lever by pulling it forward.
5. Be sure to insert the roll paper between the frame and plastic roller of the separator.



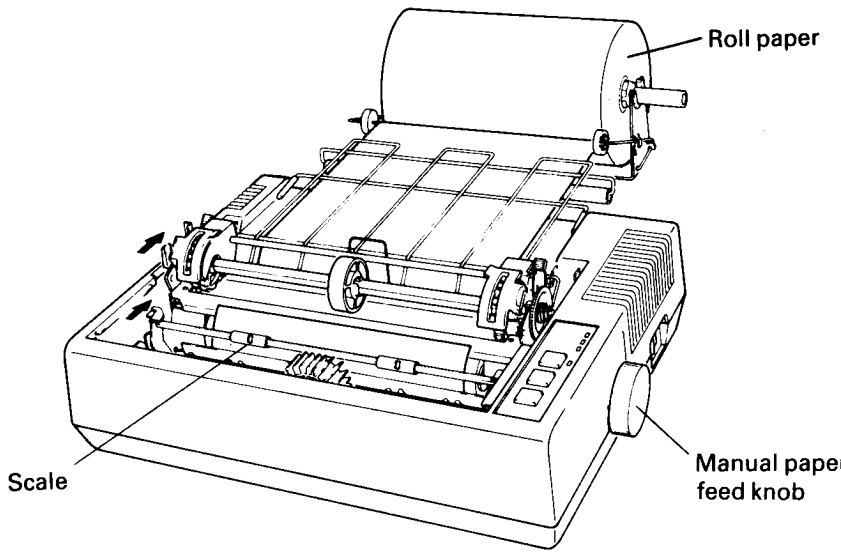
Loading of Roll Paper (1)

6. Push the paper into the insertion slot between the paper guides at the rear part of the printer mechanism.



Loading of Roll Paper (2)

7. Lock the release lever.
   NOTE:
   Two-ply roll paper is not recommended for use.
8. While turning the paper feed knob clockwise, confirm that the paper advances straight up. If not, adjust the inserted paper position by unlocking the release lever.



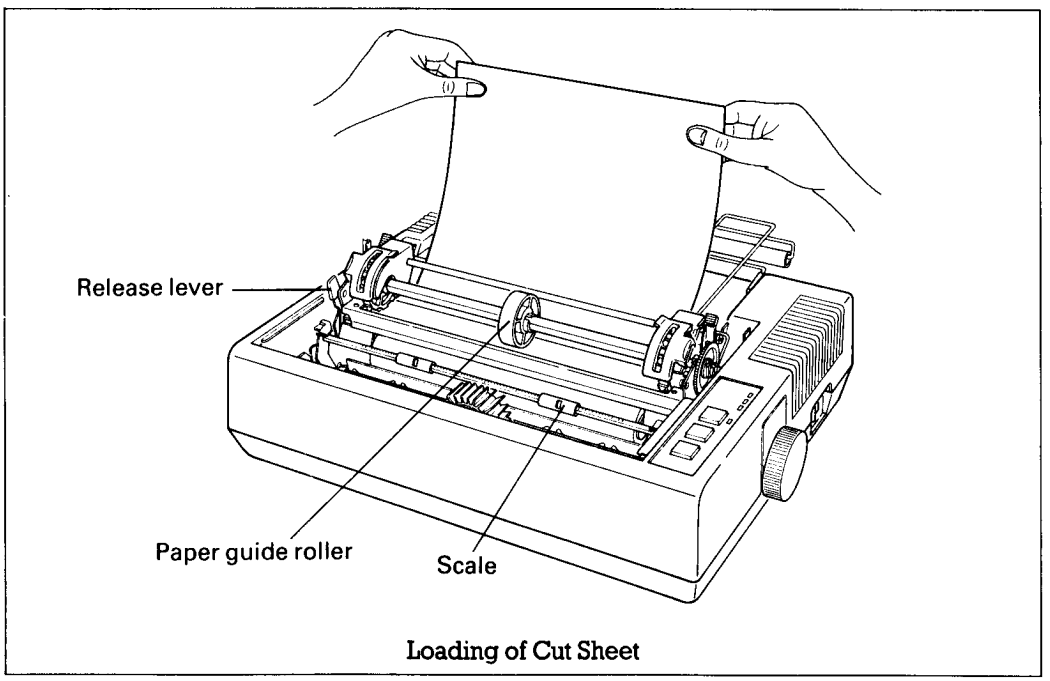
Loading of Roll Paper (3)

9. Push the scale back into position.
10. Put the printer cover on the printer.

1.9.6 Cut sheet (with friction feed) (RX-80 F/T only)

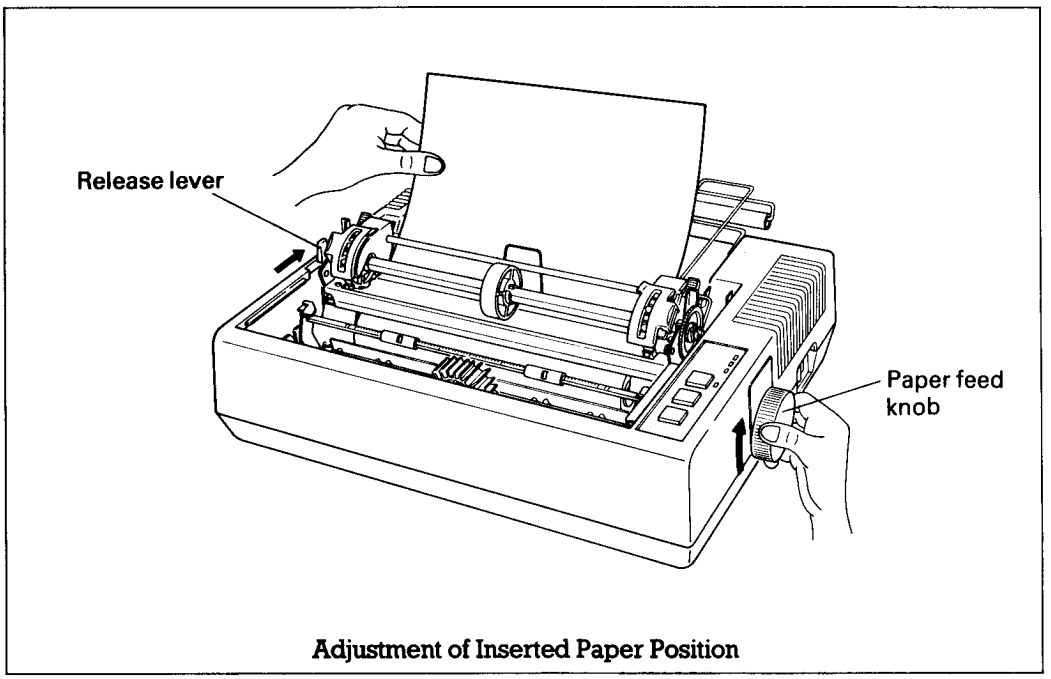
The RX-80 F/T accommodates cut sheets measuring 8.3″ to 8.5″ by 12″ (maximum). To load a cut sheet, observe the following procedure.

1. Raise the printer cover.
   (With the RX-80 F/T, slide both sprockets outward to the sides and lock the sprocket lock levers.)
2. Pull the scale toward the front of the printer to detach the scale from the platen.
3. Unlock the release lever and set the paper guide roller at the center of the sprocket shaft. This contributes to smooth paper feeding.
4. Insert the cut sheet between the paper guides at the rear part of the printer mechanism.
   NOTE:
   Cut sheets can be loaded without removing the separator.



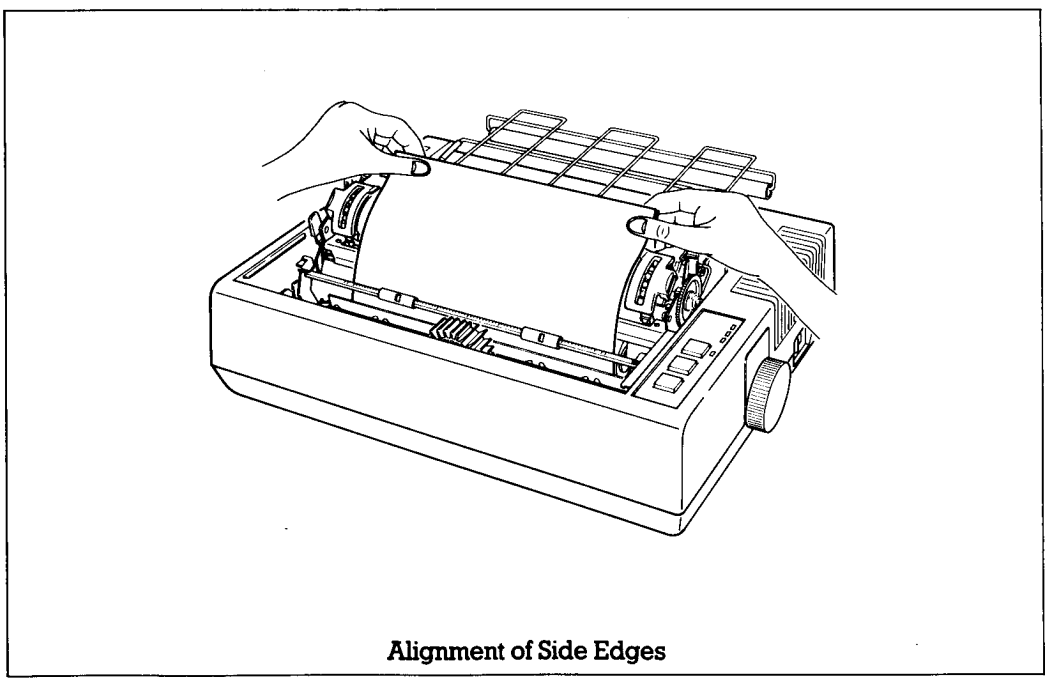
Loading of Cut Sheet

5. Lock the release lever.
6. While turning the paper feed knob clockwise, confirm that the paper advances straight up.



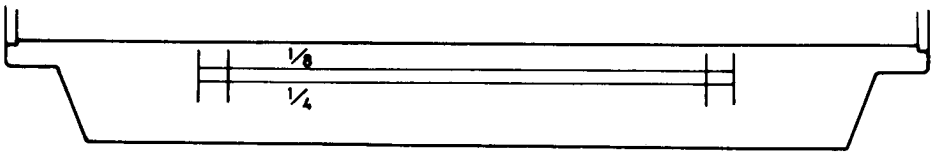
Adjustment of Inserted Paper Position

If it does not, adjust the inserted paper position by aligning the edges of the paper after unlocking the release lever as shown below.



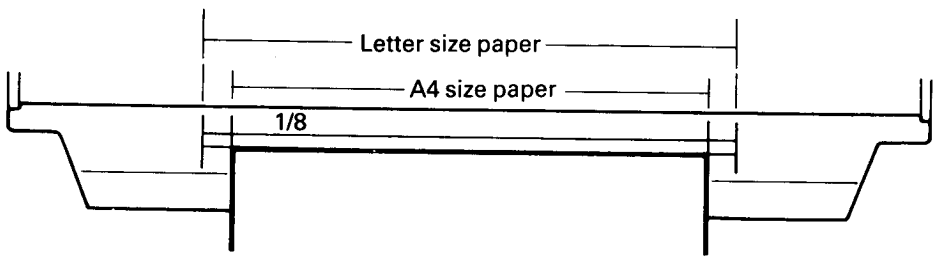
Alignment of Side Edges

If the cut sheet or form is not long enough to align the side edges, align the top edge of the paper with the form position setting mark on the tractor unit.



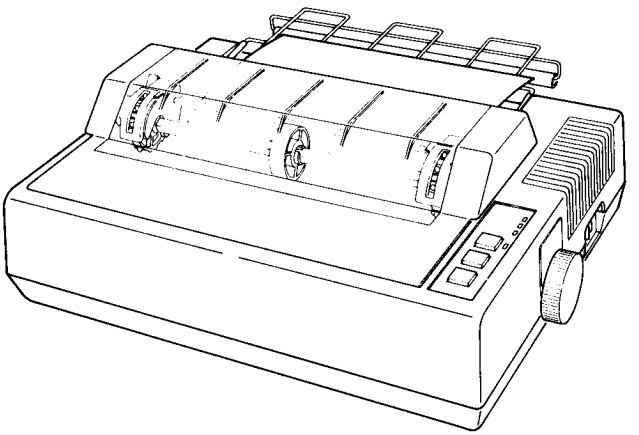
Form Position Setting Mark

If the paper is set on the line marked 1/4 as shown below printing starts from a position 28.6 mm below the top edge of the paper. If the paper is set on the line marked 1/8, then the printing starts from a position 30.2 mm below the top edge of the paper.



Setting of Cut paper Sheet

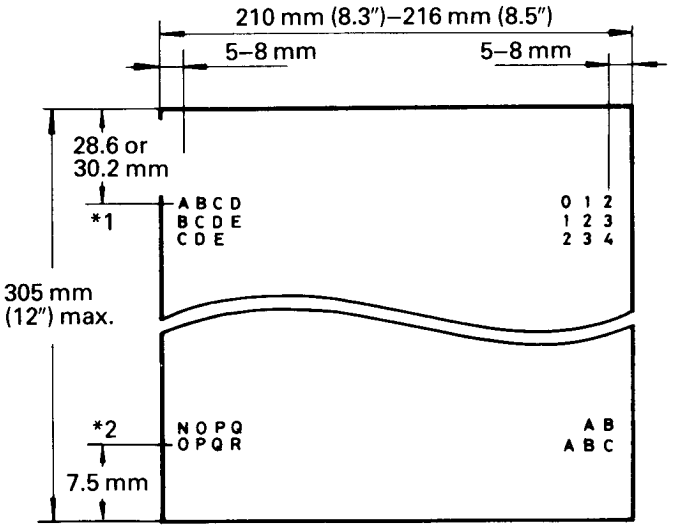
7. Push the scale back into position and put the printer cover on the printer.



Printer with Cut Sheet Set Completely

<Print Area for Cut Sheet>

The print area must be within the range indicated below.



*1: Starting position when the top of cut sheet is set on the Form Position Setting Mark on the tractor unit.

*2: The paper-end detector can be disabled either by software (ESC 8) or by hardware (setting DIP SW 1-5 to ON). When the paper-end detector is disabled, printing can be performed to the bottom of the paper. However, the quality of printing performed within 7.5 mm of the bottom of the paper cannot be guaranteed.

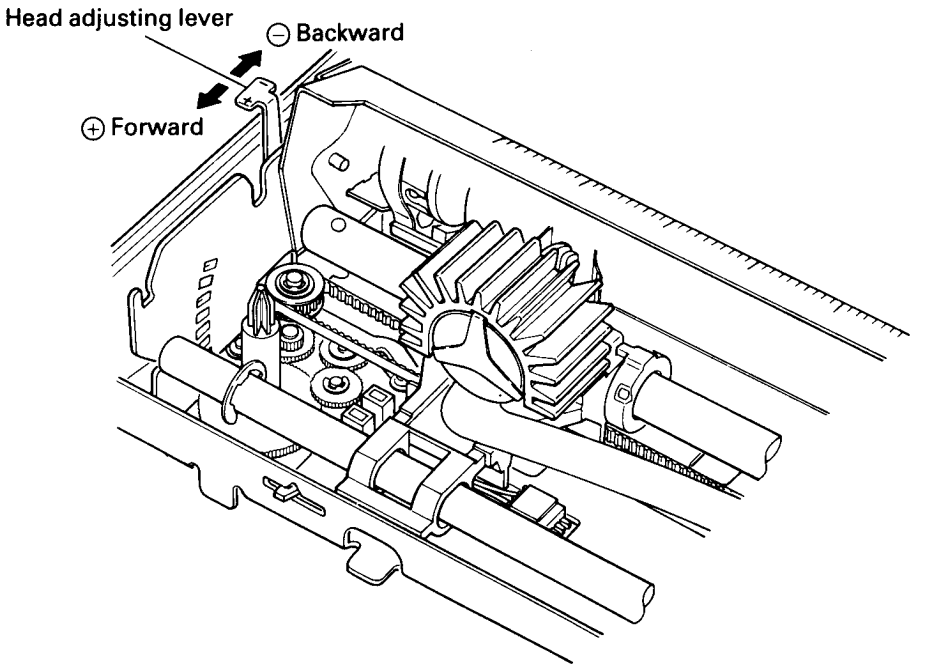
1.10 Gap Adjustment

The adjustment of a gap between the head nose and the platen is used to adjust the printing pressure as well as to suit paper of a different thickness.

(1) Move the head adjusting lever (located on the left frame of the printer) forward or backward to adjust the gap between the head nose and the platen.

Forward: To widen gap.
Backward: To narrow gap.

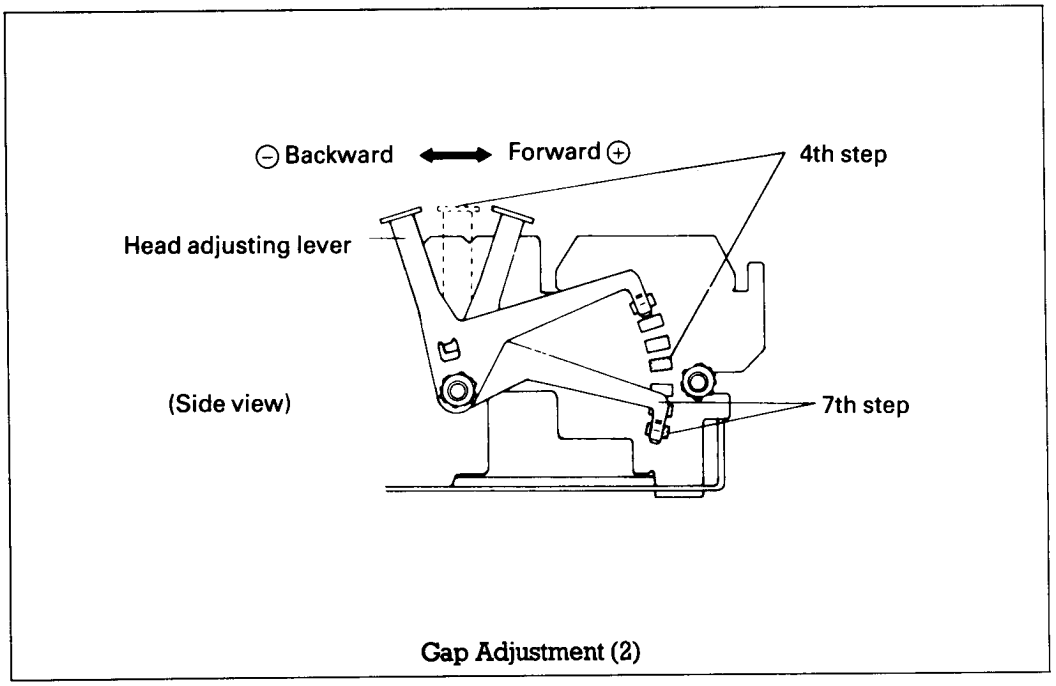
NOTE:
With a thick paper, be sure to widen this gap.



Gap Adjustment (1)

(2) Adjust the position of the head adjusting lever according to the type of paper to be used.

Paper	Position of adjusting lever
Single-leaf paper	Set the lever to the 4th step.
Carbon paper sheets	Set the lever to the 7th step.



Gap Adjustment (2)

NOTES:

1. *Should printed characters become faint due to the use of the printer for an extended period, move the head adjusting lever backward (in the ⊖ direction) by one step.*
2. *When a set of carbon paper sheets is used, be sure that no characters are printed within the area two lines each above and below the perforation.*
3. *Use carbon copies joined by spot-pasting or line-pasting.*

Chapter 2 OPERATION

Keep long hair away from the printer when it is operating.

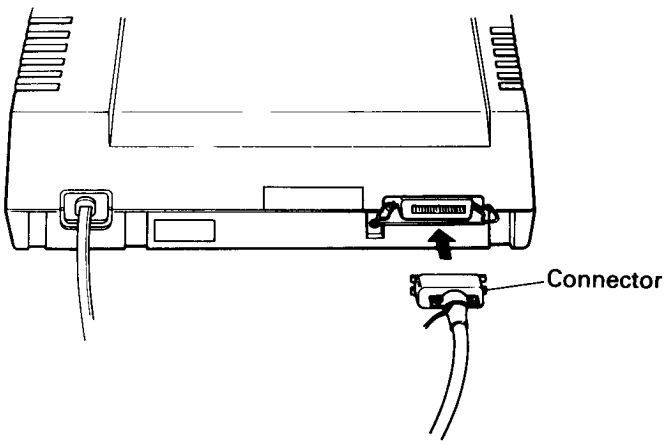
2.1 Printer Cable Connection

2.1.1 Power connection

The EPSON RX-80 and RX-80 F/T Dot Matrix Printers are capable of operating on the following three types of AC power.

(1) AC 120V, 50/60 Hz
(2) AC 220V, 50/60 Hz
(3) AC 240V, 50/60 Hz

Before connecting the RX printer to a power source, make certain of the primary AC rating from the label.
After connection of the printer to the proper power source and upon application of power to the printer, "Initialization" will take place in the printer with the effects described in paragraph 2.6. If your RX printer has a primary AC rating different from the available power source, do not attempt to operate the printer.
Please obtain a replacement unit with the correct AC rating from the store where you purchased the RX printer.

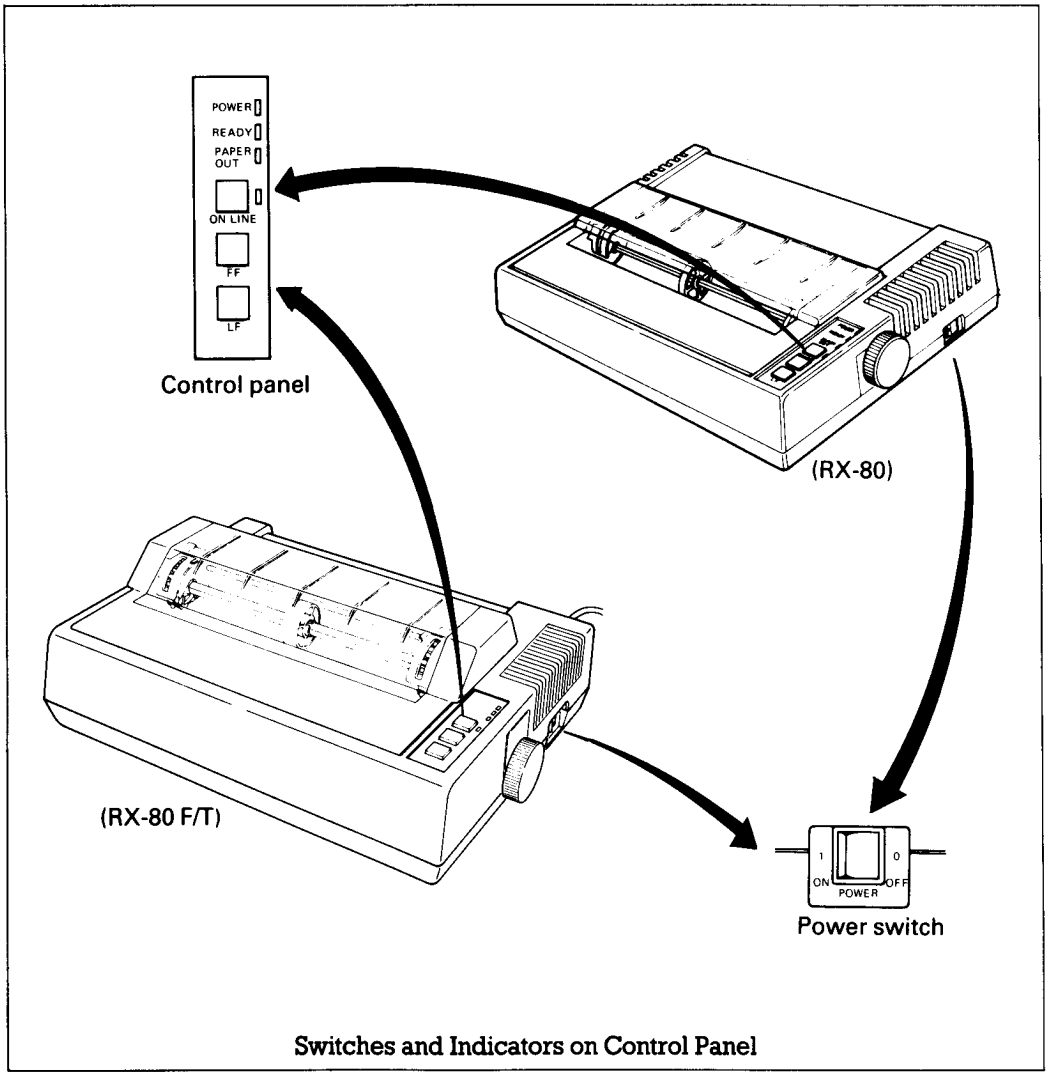


Printer Cable Connection

1. Be sure both the computer and printer are turned OFF.
2. Be sure you have the right cable and connect it to the printer by giving it a firm push to secure the clips.
3. Double-check to ensure that the cable is in place and locked.

2.2 Switches and Indicators

There are three switches and four indicators on the control panel and one power switch on the right side of the printer case.
In this section, panel operating procedures are covered in sufficient detail for the user to become familiar with the printer.



Switches and Indicators on Control Panel

2.2.1 Switches

POWER SW: Controls primary AC power to the printer.

NOTE:

Before turning this switch ON, check to see if the paper is properly set in the printer.

Incorrect setting of the paper may prevent the printer from operating properly.

ON LINE SW: When the power switch is turned ON after paper has been loaded, the printer enters the ON-LINE mode and can be utilized in conjunction with a host computer.
Depressing the ON-LINE switch will set the printer in the OFF-LINE mode and cause the green LED to go out. The switch does not function while the printer is actively engaged in printing.
The printer is automatically placed OFF-LINE if the paper supply is exhausted or if a mechanical error occurs in the printer.
The operations of the Line Feed and Form Feed switches are effective only while the printer is OFF-LINE.

FF SW: (Form Feed) When this switch is depressed once, the paper is advanced vertically to the next Top of Form position.
This switch must be depressed while the printer is OFF-LINE. Otherwise, the form feed operation will not be carried out.
The Top of Form position is initialized when the POWER switch is turned on, when $\overline{\text{INIT}}$ signal is applied to the interface connector, or when the ESC @ code is input.
Therefore, before turning the POWER switch ON to start operating the printer, set the paper at the appropriate Top of Form position.

LF SW: (Line Feed) The paper advances while this switch is being depressed. The line feed operation is prohibited while the printer is actively engaged in printing.

2.2.2 Indicators

POWER: Illuminates while the printer is receiving AC power.
READY: Illuminates when the printer is ready to receive data.
PAPER OUT: Illuminates when the paper supply is near its end.
ON LINE: Illuminates when the printer is in the ON-LINE mode.

2.3 Buzzer

The buzzer is located inside the printer case, and sounds for approximately 0.2 second when the printer receives BEL code. (See Chapter 3 for the BEL code.) Buzzer sounds for 3 seconds when an error (end of paper, mechanical) is detected.

2.4 Paper-End Detector

(1) When the paper-end detector (a reed switch located on the paper guide) detects that the paper supply is nearly exhausted, the printer informs to the host computer that an error has occurred and the printing operation stops.
(2) In the paper-out status, the printer is automatically put in the OFF-LINE state and paper advancement can be performed by depressing the LF or FF switch. After setting new paper in the printer, depress the ON-LINE switch so that the printer may resume operation.
(3) There is another way to start the printer when it falls into paper-out status. Set new paper in the printer, and turn the POWER switch OFF and ON again. In this case, however, all previously established data such as TAB, line spacing, etc., are cancelled.
(4) The paper-end detecting function is useful to prevent erroneous printing when the printer is out of paper. If the printing is to be continued up to the last line of the paper, the paper-end detecting function may be made invalid by either of the following two methods.
    1) Set the DIP switch pin 1-5 to the ON position, and the paper-end detecting function will become invalid hardwarewise.
    2) Enter control code ESC 8 to disable the paper-end detecting function by software.

Interface Signals in Paper-Out Status

Signal	Pin No.	Paper-End Detector Enabled	Paper-End Detector Disabled
$\overline{\text{ERROR}}$	32	LOW	HIGH
PE (Paper-End)	12	HIGH	HIGH
BUSY	11	HIGH	LOW
$\overline{\text{ACKNLG}}$	10	No pulse is output.	Pulse is output.

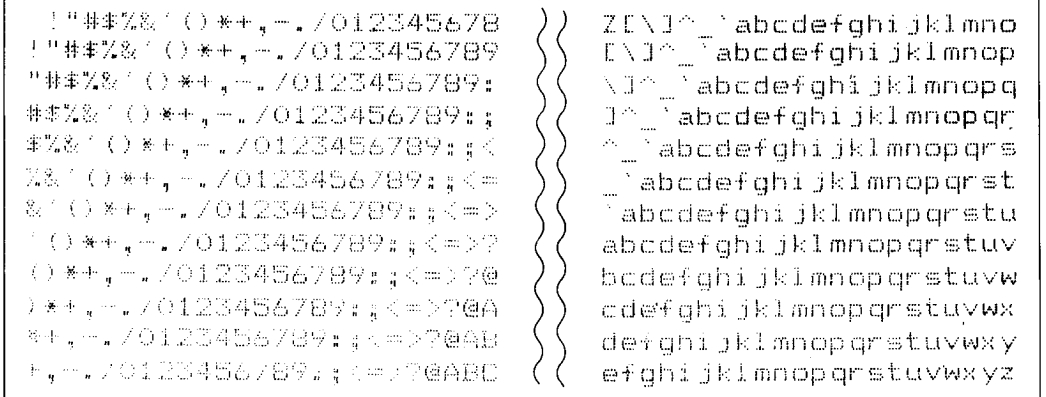
2.5 Self-Test

The RX printer has a self-test (self-diagnostic) function to check the following.

(1) Print head operation and printing quality
(2) Operation of the printer mechanisms (motor, cartridge ribbon mechanism, drive belt, etc.)

The self-test function is preprogrammed in the printer's circuitry and can be performed by turning the POWER switch ON while depressing the LF switch. All characters provided by the internal software are printed out on the paper.

(Printout sample)



NOTE:
The self-test function cannot be performed when the printer is out of paper.

2.6 Printer Initialization

Printer initialization is accomplished in one of the three ways described below.

(1) Initialization takes place automatically each time the primary AC power source is interrupted and reapplied (i.e., by turning the Power Switch OFF and ON).
(2) Initialization may be initiated remotely by activating the $\overline{\text{INIT}}$ signal to the parallel interface connector.
Upon application of the initialization signal, the following sequence of events take place in the printer.
   1) The print head returns to its home position.
   2) The printer is automatically placed ON-LINE, unless it is out of paper.
   3) The print buffer is cleared.
   4) The Text mode is selected as the print mode.
   5) Either Pica-sized or Condensed mode is selected.
      (a) When DIP switch pin 1-1 is OFF, the Pica-sized print mode is selected.
      (b) When DIP switch pin 1-1 is ON, the Condensed print mode is selected.
   6) The form length per page is set at either 11 or 12 inches.
      (a) When DIP switch pin 1-4 is OFF, the form length is set at 11 inches per page.
      (b) When DIP switch pin 1-4 is ON, the form length is set at 12 inches per page.
   7) The printer reverts to the settings obtained by the ON/OFF positioning of the DIP switch pins. (Refer to 2.7 Setting DIP Switch.)
(3) Initialization may be initiated programmably upon input of the ESC @ code.

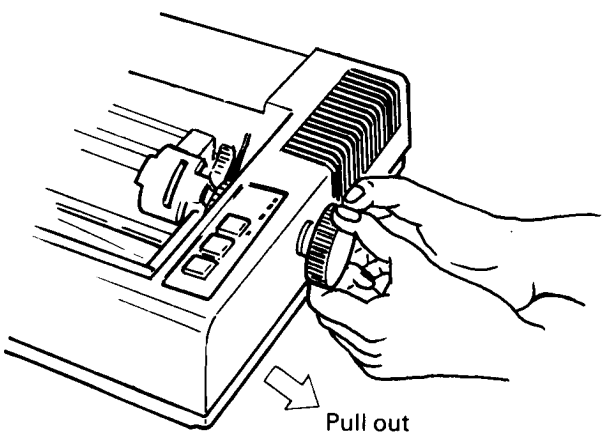
2.7 Setting DIP Switches

In order to suit user's specific requirement, desired control modes are selectable via two built-in DIP switches. These DIP switches are located inside the printer.

To obtain access to the DIP switches, follow the steps listed below.

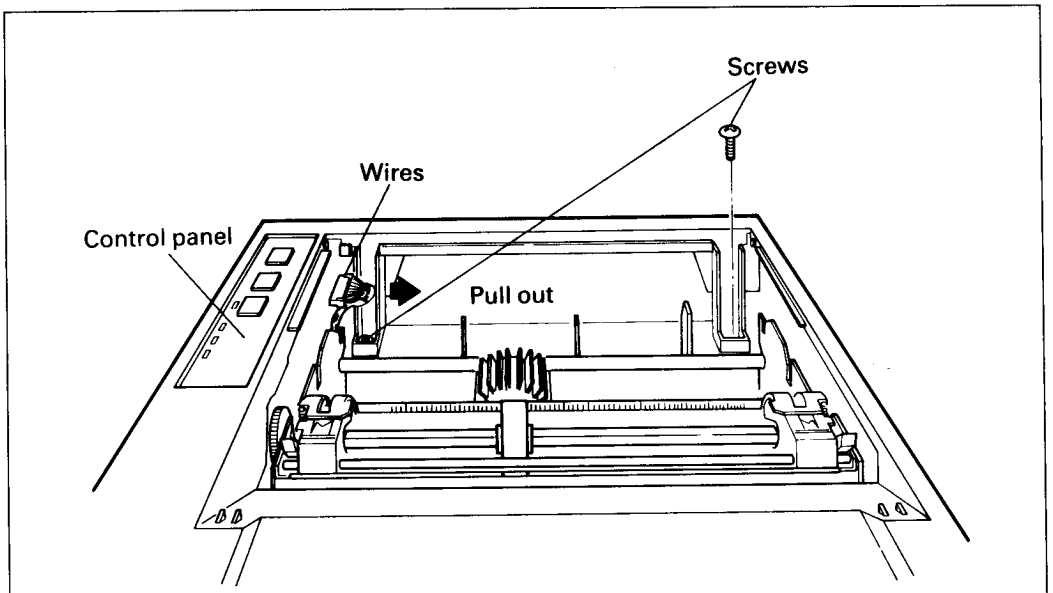
CAUTION:
The electronic components in the printer can be damaged by static electricity discharges. To avoid damage, make sure you discharge any static electricity from your hands and avoid touching components on the circuit boards other than the DIP switches.

1. Unplug the power cord.
2. Remove the pin-feed paper (if loaded) and the separator.
3. Remove the manual paper feed knob by pulling it straight out, with firm but steady pressure.



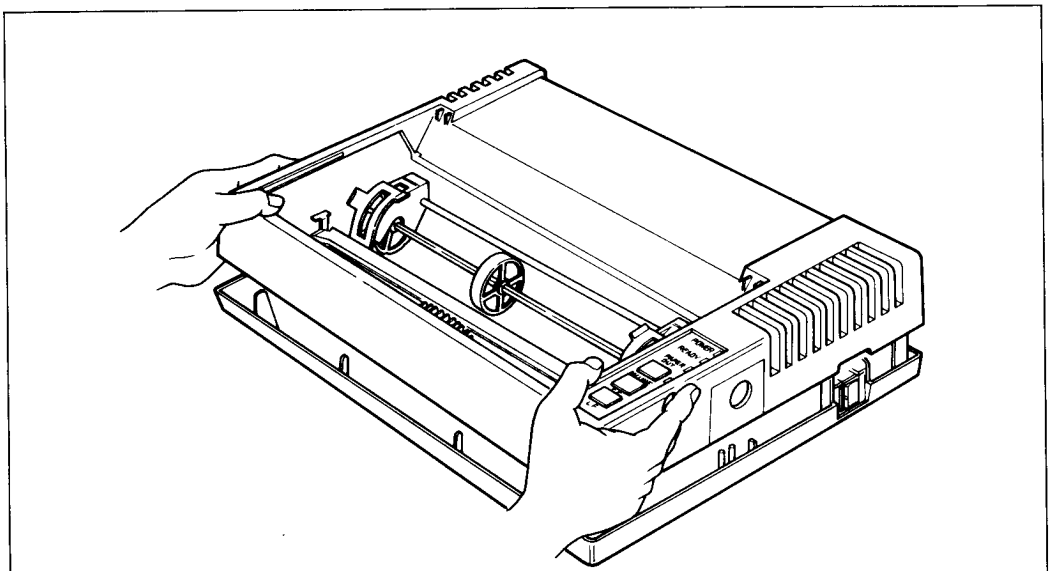
Removing Manual Paper Feed Knob

4. Remove the two screws that hold the upper case of the printer with a Phillips-type screwdriver.
5. Pull out the wires hooked to the control panel on the right.



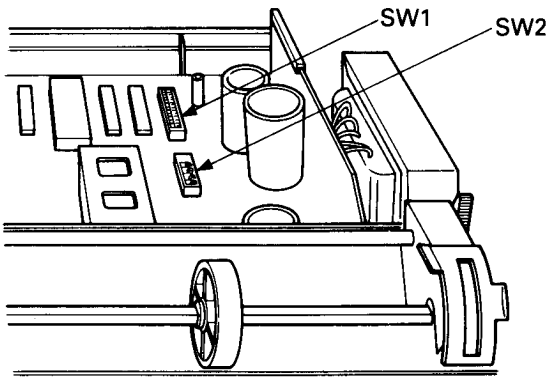
Removal of Upper Case (1)

6. Lift the edge of the upper case closest to you and then remove the case pulling upward.



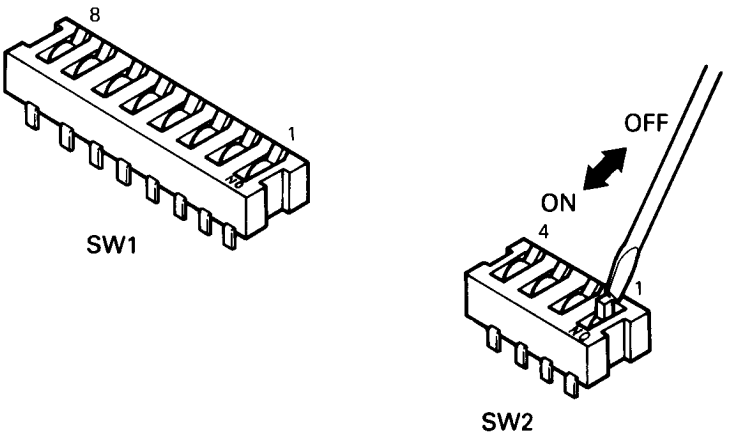
Removal of Upper Case (2)

There are two DIP (Dual In-Line Package) switches inside the printer.



Location of DIP Switches

The switches set to the left are ON, to the right are OFF.
After confirming that the power cord has been disconnected from the AC outlet, set these switches.



Setting of DIP Switches

After setting of the DIP switch, set the printer.

2.7.1 Setting of DIP switch No. 1

The DIP switch No. 1 consists of the following 8 pins. A summary or the functions of the respective DIP switch pins and their preset conditions at the time of shipment are shown in Table 2-2.

Table 2-2 Functions and Conditions of DIP Switch No. 1

SW pin	Function	OFF	ON	Factory-set Condition
1-1	Selects Pica-sized or Condensed mode.	Pica-sized	Condensed	OFF
1-2	Sets control codes $(128)_D$ through $(159)_D$ as graphic symbols.	Control code	Graphic symbol	OFF
1-3	Sounds the buzzer.	Sounds	Does not sounds	OFF
1-4	Form length	11-inch	12-inch	OFF
1-5	Paper-end detector	Valid	Invalid	OFF
1-6	International character set	See Table 2-4.		
1-7	International character set	See Table 2-4.		
1-8	International character set	See Table 2-4.		

(1) *SW1-1:* Setting this pin to the ON position will cause the printer mode to be set to the Condensed print mode upon power application; setting to the OFF position, to the Pica-sized print mode.

(2) *SW1-2:* Graphic symbols corresponding to control codes $(128)_D$ through $(159)_D$ are selected by setting this pin to the ON position.

(3) *SW1-3:* This pin is used to enable or disable the buzzer.
When this pin at ON position, the buzzer will not sound. When this pin is at OFF position, buzzer will sound.
If a mechanical error occurs, the buzzer will sound regardless of the setting of this pin.

(4) *SW1-4:* Setting this pin to the ON position will cause the form length per page to be set at 12 inches. The form length per page becomes 11 inches when this pin is set to the OFF position.

(5) *SW1-5:* This pin is used to activate or inactivate the paper end detector. When this pin is turned ON, the paper end detection function becomes invalid upon power application and the printer is allowed to operate even if it is out of paper.
With the printer in this state, input of control code "ESC 9" will permit the paper end detector to be activated again.

(6) *SW1-6, SW1-7 and SW1-8:* Combined use of these three pins permits selection of an international character set.

2.7.2 Setting of DIP switch No. 2

The DIP switch No. 2 consists of the following 4 pins. A summary of the functions of the respective DIP switch pins and their preset conditions at the time of shipment are shown in Table 2-3.

Table 2-3 Functions and Conditions of DIP Switch No. 2

SW pin No.	Function	OFF	ON	Factory-set condition
2-1	ZERO font	0	Ø	OFF
2-2	$\overline{\text{SLCT IN}}$ signal internally fixed or not fixed	Not fixed	Fixed	ON
2-3	Automatic line feed	LF must be from host	Auto LF with CR	OFF
2-4	1 inch skip-over perforation	Invalid	Valid	OFF

(1) *SW2-1:* Setting this pin to the ON position will cause character "Ø" (zero with slash) to be printed.

(2) *SW2-2:* When this pin is set to the OFF position, the $\overline{\text{SLCT IN}}$ signal is not fixed internally, thus permitting the printer to be controlled by a host computer. This refers to pin No. 36 on the connector. Some computers control this pin; if they do control the pin, SW should be OFF.

(3) *SW2-3:* Forces automatic LF with each CR. When OFF, LF must be provided via software as needed.

(4) *SW2-4:* This pin is used to set the automatic skip-over perforation function.
   1) When this pin is set to the ON position, the 1-inch automatic skip-over perforation will be performed.
      By this function, the paper automatically advances to the first line of the next page when the remaining page length is 1 inch.
   2) When this pin is set to the OFF position, the 1-inch automatic skip-over perforation will not be performed.

2.7.3 International character sets

Table 2-4 shows International Character Set Designation according to the combination of the DIP switch pins 1-6, 1-7 and 1-8.

Table 2-4 International Character Set Designation

Country	SW 1-6	SW 1-7	SW 1-8
U.S.A.	ON	ON	ON
FRANCE	ON	ON	OFF
GERMANY	ON	OFF	ON
ENGLAND	ON	OFF	OFF

Country	SW 1-6	SW 1-7	SW 1-8
DENMARK I	OFF	ON	ON
SWEDEN	OFF	ON	OFF
ITALY	OFF	OFF	ON
SPAIN	OFF	OFF	OFF

The above settings can be changed to any country character sets by inputting ESC R control codes. (Described in Chapter 3.)
The above countries' characters are addressed as per the following table.

NOTE:

The Japan, Norway and Denmark II (European version) character sets cannot be set by setting the DIP switch pins. Set them by using the ESC R code. For details, refer to the description of the ESC R code in Chapter 3.

Table 2-5 International Character Sets

Country / Dec.code	U.S.A.	France	Germany	England	Denmark I	Sweden	Italy	Spain
35 (23)	#	#	#	£	#	#	#	Pt
36 (24)	$	$	$	$	$	Ö	$	$
64 (40)	@	à	§	@	@	É	@	@
91 (5B)	[	°	Ä	[	Æ	Ä	°	¡
92 (5C)	\	ç	Ö	\	Ø	Ö	\	Ñ
93 (5D)	]	§	Ü	]	Å	Å	e	¿
94 (5E)	^	^	^	^	^	Ü	^	^
96 (60)	`	`	`	`	`	é	ù	`
123 (7B)	{	é	a	{	æ	a	à	{
124 (7C)	|	ù	o	|	ø	o	ò	ñ
125 (7D)	}	è	ü	}	å	å	è	}
126 (7E)	~	¨	ß	~	~	u	ì	~

Numbers in parentheses are hexadecimal codes.

NOTES:

1. *DIP switch pins 1-6, 1-7 and 1-8 are factory-set as follows.*

   120V version: U.S.A.
   240V version: England
   220V version: Germany

   Select your desired character set by the DIP switch setting or programming.
2. *The Form Length is factory-set at 12 inches for the 220V version. However, the factory-set Form Length for 220V-version printers for export to Southeast Asia is 11 inches.*

Chapter 3 CONTROL CODES

With the RX-80 and RX-80 F/T, two standard operation modes are available. One is the Text mode which prints corresponding characters on normal ASCII coded inputs and the other, the Bit Image mode which permits printing of pictures and images in dot configurations.
The RX printer has been designed as a terminal unit capable of various software controls. When control codes are transferred to the printer, respective functions governed by these codes such as form feed, line feed, etc., are executed immediately. In order to permit the printer to fully exhibit these functions, careful reading and thorough understanding of the following control codes are recommended.
In this section, first the control codes in Text mode are classified into groups. These two modes are not fully independent of each other in that paremeters set in the Text mode are also effective in the Bit Image.

3.1 Definitions of Some Terms Often Used

Before attempting to program, please read this section carefully as it contains information essential to programming.

(1) 2 (Binary), D (Decimal) and H (Hexadecimal)

$(\ )_2$, $(\ )_D$ and $<\ >_H$ respectively represent binary, decimal and hexadecimal numbers.
The control codes are described in decimal notation; however, you have to be familiar with binary notation to function the Bit image mode.

(2) ASCII code

Characters in computer systems are represented by groups of bits. The various groups of bits that represent the set of characters that are the "alphabet" of any given system are called a "coding system", or simply "code".
Codes for representing the information vary in relation to both the number of bits used to define a single character in the assignment of bit patterns to each particular character.
In ASCII (American Standard Code for Information Interchange) the bit group $(01000001)_2 = (65)_D = <41>_H$ represents the character "A".
The sending and receiving equipment must be programmed to acknowledge the code used in computer systems.
The printer has a 96 character set, control codes, and 11 International Character sets. These characters are also available in the Alternate mode.
International characters are put in some addresses of the ASCII code table instead of the standard characters.
Alphabets, numbers and special symbols are addressed from $(32)_D$ to $(126)_D$ and from $(160)_D$ to $(254)_D$. Same characters are put in two different addresses. If your host computer can send 8-bit data to the printer, the selection of which one to use is up to you.

(3) Escape codes

In order to expand its processing capability, the RX printer is provided with control codes called the ESC sequence.
ESC code $(27)_D$ followed by any alphanumeric or symbolic character, gives special functions to the printer.
For example,

1) To set column length
2) To enter Bit image print mode, etc.

Generally, printer control codes, especially like "ESCAPE", i.e., CHR$(27), are not standardized. Every computer and printer manufacturer applies its own meaning to such codes.
The "ESCAPE" codes used in the printer should not be confused with the escape key which some computers have. So be familiar with these control codes.

(4) Buffer-full print

When a full line of print data (including spaces) has been input and the next data is valid and printable, the contents of the print buffer will be automatically printed followed by a line feed. Printing in this manner is called "Buffer-full print."
At this time, the Enlarged mode set by the SO or ESC SO code is cancelled.
When power is applied to the printer, the column width in each print mode becomes as follows;

Pica-sized mode 80 columns
Condensed mode 132 columns

The column width may be changed by the ESC Q code (right margin setting). However, since the right margin is set as an absolute position, the column width set to 80 columns in the Pica-sized mode will become 137 columns, in the Condensed mode.
Also, when the left margin is set by ESC l, the buffer becomes full at the right margin setting in effect at that time.
NOTE:
The print buffer is a temporary storage to store data input to the printer. The print buffer stores only the print data and does not store commands.

(5) HEX DUMP

Turn the Power switch ON while holding down both the LF and FF switches. The printer then enters the hexadecimal dump printing. If you execute programs or list programs in HEX DUMP, all data sent from the host computer will be printed out in hexadecimal notation.

For example;
When the following 4 data are sent from the host computer,

```
LPRINT CHR$(0);CHR$(27);"A";CHR$(24);
```

the data are output on the printer in hexadecimal notation as follows.

```
00  1B  41  18
```

Printing by HEX DUMP mode is performed only when the printer is in the buffer-full state. The data remaining in the print buffer can be printed out when the printer is set in OFF-LINE mode.

HEX DUMP cannot be cancelled during printing operation.

Note that in some programming languages such as BASIC, PASCAL, etc., there are a few codes that cannot be sent to the printer.
In such a case, you may use HEX DUMP to check if the correct codes are being sent to the printer.

(6) How to send control codes

Printing and other functions are controlled by inputting control codes such as CR, ESC −, etc.

Control codes may be broadly divided into the following two categories.

(1) 1-byte control codes
(2) Control codes expanded by an ESC code

In BASIC, control codes can be sent to the printer as follows.

(Example 1) To send BEL code,

```
LPRINT CHR$(7);
```

<beep>

(Example 2) To send ESC − $(1)_D$ code,

```
LPRINT CHR$(27);"-";CHR$(1);
```

— NOTICE —

For convenience' sake, program examples in this manual have been written in one of Microsoft BASIC.
For details of BASIC, refer to the reference manual of your host computer. BASIC itself is different depending on the specifications of the host computer and there are versions in which certain codes (such as CHR$(9) and CHR$(13)) cannot be sent to the printer.

3.2 Control Codes in the Text Mode

3.2.1 Print execution

CR

Name **CR** — Carriage Return

Expression **CHR$(13);**

Function Starts printing.

When this code is input, all the data stored in the print buffer is printed.

When, $\overline{\text{AUTO FEED XT}}$ (Pin No. 14 of the interface connector) is at "LOW" level or if the DIP switch pin 2-3 is set to ON, the paper is advanced one line automatically after the execution of printing by the CR code.

The amount of paper feed is set by the ESC 0, ESC 1, ESC 2, ESC 3 or ESC A.

Input of CR code with line feed will cancel the Enlarged print mode set by the SO code.

If no data precedes the CR code, or if all preceding data is SPACE, the carriage assembly does not move. Under this condition, if $\overline{\text{AUTO FEED XT}}$ is at "LOW" level or if the DIP switch pin 2-3 in ON, the paper is advanced by one line.

See also LF

LF

Name **LF** — Line Feed

Expression **CHR$(10);**

Function Advances paper one line.

When this code is input, all the data stored in the print buffer is printed out and then line feed is carried out.
If no data precedes the LF code, or if all preceding data is SPACE, only line feed is performed.
This code cancels the Enlarged print mode set by the SO code. The amount of paper feed may be set by ESC 0, ESC 1, ESC 2, ESC 3 or ESC A code. If the data is input in the order of print data → CR → LF, data will be printed by the CR code. Then the printer carries out one line feed because no print data precedes the LF code.

When the number of lines to be skipped at the bottom of a page is specified by the ESC N code and when the paper is fed into the area (where the skip-over perforation function is performed) by one line spacing, the paper is fed to the Top of form position of the next page.

See also SO, ESC SO, ESC 0, ESC1, ESC 2, ESC 3, ESC A and ESC W

ESC J

Name **ESC J** — Tentative n/216 inch Line Spacing

Expression **CHR$(27);"J";CHR$(n);**
(0 ≤ n ≤ 255)

Function Feeds n/216 inch line spacing for one line.

This code causes the printer to print the data in the print buffer and executes n/216 inch paper feed.

See also ESC 3

Example To execute 113/216 inch line spacing

```
10 LPRINT "          FREE INFORMATION!
20 LPRINT CHR$(27);"J";CHR$(113)
30 LPRINT "User Inquiry Service"
40 LPRINT "     from EPSON"
```

```
          FREE INFORMATION!



User Inquiry Service
     from EPSON
```

NOTE:
With n=1 and n=2, paper feeding accuracy is not guaranteed. If the value of n is set as 0, no paper feeding will be executed.
The ESC 3 code causes the same n/216 inch line spacing as the ESC J code.

FF

Name **FF** — Form feed

Expression **CHR$(12);**

Function Advances paper to next Top of Form.

When this code is input, all the data stored in the print buffer is printed out and then paper feed is carried out in accordance with the predetermined form length.
If no print data is stored in the print buffer, the print operations do not take place and the paper is fed to the Top of form position of the next page so that the following data can be printed.
This code cancels the Enlarged print mode set by the SO code.

The Top of Form is determined when the POWER switch is turned on or the $\overline{\text{INIT}}$ signal is applied, or when the ESC @ code is input. If the form length per page is not set, one page length of form is regarded as 11 inches with the DIP switch pin 1-4 on the control circuit board set to the OFF position or 12 inches with the DIP switch pin 1-4 set to the ON position.

See also ESC C

3.2.2 Print mode

ESC M

Name **ESC M** — Elite-sized Character Setting

Expression **CHR$(27);"M";**

Function Sets elite-sized character.

Input of ESC M code causes the data following this code to be printed in Elite-sized characters (12 characters per inch).
In this mode, input of the emphasized or condensed printing code affects only the internal flag of the printer. The print mode does not change.

See also ESC P, SI, DC2, ESC E and ESC F

Example

```
10 'Elite-sized Printing
20 LPRINT "Pica-sized Character"
30 LPRINT CHR$(27);"M";
40 LPRINT "Elite-sized Character"
```

```
Pica-sized Character
Elite-sized Character
```

ESC P

Name **ESC P** — Pica-sized Character Setting

Expression **CHR$(27);"P";**

Function Cancels ESC M code.

When the ESC P code is input, the Elite-sized print mode set by the ESC M code is cancelled and the printer returns to Pica-sized print mode. Note, however, that ESC P is only effective to cancel the ESC M code and does not cancel print modes such as Enlarged or Condensed print modes, etc.

See also ESC M

Example

```
10 'Pica-sized Printing
20 LPRINT CHR$(27);"P";
30 LPRINT "Pica-sized Character"
40 LPRINT
50 LPRINT CHR$(27);"M";
60 LPRINT "Elite-sized Character"
70 LPRINT
80 LPRINT CHR$(27);"P";
90 LPRINT "Pica-sized Character again"
```

```
Pica-sized Character

Elite-sized Character

Pica-sized Character again
```

SO

Name **SO** — Shift Out

Expression **CHR$(14);**

Function Sets Enlarged print mode.

When the SO code is input, all data that follows this code on the same line is printed out in enlarged characters. This code is cancelled by line feed or by the input of DC4 or ESC W code.

See also DC4 and ESC W

Example

```
10 'Enlarged mode with auto-reset
20 LPRINT CHR$(14);
30 LPRINT "Enlarged"
40 LPRINT "Pica-sized"
```

```
Enlarged
Pica-sized
```

NOTE:
The difference between the SO code and the ESC W code is that the SO code is cancelled by a line feed. The ESC SO code is the same as the SO code.

DC4

Name **DC 4** — Enlarged Mode Cancel

Expression **CHR$(20);**

Function Cancels Enlarged print mode set by the SO code.

The DC4 code cancels the Enlarged print mode set by the SO code.

See also SO and ESC W

Example

```
10 'Enlarged Mode Cancel
20 LPRINT CHR$(14);
30 LPRINT "Enlarged";
40 LPRINT CHR$(20);
50 LPRINT "    Pica-sized"
```

```
Enlarged    Pica-sized
```

NOTE:
The Enlarged print mode set by the ESC W code cannot be cancelled by input of this code.

ESC W

Name **ESC W** — Enlarged Mode

Expression **CHR$(27);"W";CHR$(n);**
(1) n=1 or 49: Sets Enlarged print mode.
(2) n=0 or 48: Cancels Enlarged print mode

Function Sets/cancels Enlarged print mode.

(1) Sets enlarged print mode. (n=1 or 49)
When ESC W $(1)_D$ or ESC W $(49)_D$ code is input, all the data following this code is printed out in enlarged characters. Unlike the SO code, this code is not cancelled by a line feed. This code is cancelled upon input of the ESCW $(0)_D$ or ESC W $(48)_D$ code.

(2) Cancels Enlarged print mode. (n=0 or 48)
Input of ESC W $(0)_D$ or ESC W $(48)_D$ code causes the Enlarged mode set by ESC W $(1)_D$, ESC W $(49)_D$ or SO code to be cancelled.

See also SO and DC4

Example

```
10 'Enlarged Mode by ESC W
20 LPRINT CHR$(27);"W";CHR$(1);
30 LPRINT "Enlarged"
40 LPRINT CHR$(27);"W";CHR$(0);
50 LPRINT "Pica-sized"
60 END
```

```
Enlarged
Pica-sized
```

SI

Name **SI** — Shift In

Expression **CHR$(15);**

Function Sets Condensed print mode.

(1) When pica-sized characters are selected
When this code is input, all the data stored in the buffer is printed and the subsequent data is printed out in condensed characters (17 characters per inch).
This code is cancelled by the input of a DC2 code.

When the SO (Shift Out) code is input in Condensed print mode, condensed enlarged characters can be printed.

With the Emphasized print mode using the ESC E code, the SI code is processed within the printer and the actual print mode does not change.
In this case, when the Emphasized print mode is cancelled by the ESC F code, the characters are printed out in the Condensed print mode. The Emphasized print mode takes precedence over the Condensed print mode.

(2) When elite-sized characters are selected
The SI code effects only the internal flag of the printer and the print mode does not change. This code becomes effective only when the Elite-sized character mode is cancelled by the ESC P code.

See also DC2 and ESC M

Example 1

```
10 'Condensed Mode
20 LPRINT CHR$(15);"Condensed"
30 LPRINT "Still in Condensed"
```

```
Condensed
Still in Condensed
```

Example 2

```
10 'Condensed & enlarged Mode
20 LPRINT CHR$(15);"Condensed mode"
30 LPRINT CHR$(14);"Now in condensed+enlarged mode"
40 END
```

```
Condensed mode
Now in condensed+enlarged mode
```

NOTE:
The ESC SI code is the same as the SI code.

DC2

Name **DC2** — Condensed Mode Cancel

Expression **CHR$(18);**

Function Cancels Condensed print mode.

(1) When pica-sized characters are selected
The DC2 code cancels the Condensed print mode set by the SI code.

(2) When elite-sized characters are selected
The DC 2 code affects only the internal flag of the printer and the print mode does not change. This code becomes effective only when the Elite-sized character mode is cancelled by the ESC P code.

See also SI and ESC M

Example

```
10 'Condensed Mode Cancel
20 LPRINT CHR$(15);
30 LPRINT "Condensed"
40 LPRINT
50 LPRINT CHR$(18);
60 LPRINT "Pica-sized"
```

```
Condensed

Pica-sized
```

NOTE:
Although the Enlarged print mode set by the SO code can be cancelled by line feed, the Condensed print mode set by the SI code cannot.

ESC SO

Name **ESC SO** — Shift Out

Expression **CHR$(27);CHR$(14);**

Function Sets Enlarged print mode.

Same as SO code.

See also SO

Example

```
10 'Enlarged Mode by ESC SO
20 LPRINT CHR$(27);CHR$(14);"Enlarged";
30 LPRINT CHR$(20);"      Pica-sized"
```

```
Enlarged      Pica-sized
```

ESC SI

Name **ESC SI** — Shift In

Expression **CHR$(27);CHR$(15);**

Function Sets Condensed print mode.

Same as SI code.

See also SI

Example

```
10 'Condensed Mode by ESC SI
20 LPRINT CHR$(27);CHR$(15);"Condensed";
30 LPRINT CHR$(18);"      Pica-sized"
```

```
Condensed      Pica-sized
```

ESC — (minus)

Name **ESC** — (minus) — Underlined Mode

Expression **CHR$(27);"−";CHR$(n);**
(1) n=1 or 49: Sets Underlined print mode.
(2) n=0 or 48: Cancels Underlined print mode.

Function Sets/cancels Underlined print mode.

(1) Sets Underlined print mode. (n=1 or 49)
When ESC − $(1)_D$ or ESC − $(49)_D$ code is input, all the data following this code will be printed with underline.
This mode is ignored in the Bit image print mode. The underline is positioned beneath the character and is printed out as a continuous line in all print modes. When the Double-strike print mode is set by the ESC G code, the underline is also printed in double-strike.

(2) Cancels Underlined print mode. (n=0 or 48)
Input of ESC − $(0)_D$ or ESC − $(48)_D$ code causes the Underlined print mode set by the above (1) to be cancelled and all the data following this code will be printed without underline.

Example

```
10 'Underline Mode
20 LPRINT CHR$(27);"-";CHR$(1);
30 LPRINT "Moon River"
40 LPRINT CHR$(27);"-";CHR$(0);
50 LPRINT "   Wider than a mile"
```

```
Moon River
   Wider than a mile
```

ESC E

Name **ESC E** — Emphasized Mode Setting

Expression **CHR$(27);"E";**

Function Sets Emphasized print mode.

(1) When pica-sized characters are selected
When this code is input, all the data stored in the print buffer is printed out and then the data following this code is printed in emphasized characters. Emphasized printing gives each character a stronger impression, and gives high-quality printing.

This code can be input at any column position on a line. The speed of the head carriage reduces to 50 CPS while printing emphasized characters.

This print mode can be cancelled by input of an ESC F code.

(2) When elite-sized characters are selected
The ESC E code affects only the internal flag of the printer and does not affect the print mode. This code becomes effective only when the Elite-sized character mode is cancelled by the ESC P code.

See also ESC F and ESC M

ESC F

Name **ESC F** — Emphasized Mode Cancel

Expression **CHR$(27);"F";**

Function Cancels Emphasized print mode.

(1) When pica-sized characters are selected
The ESC F code cancels the Emphasized print mode set by the ESC E code.

(2) When elite-sized characters are selected
Like the ESC E code, when elite-sized characters are selected, ESC F affects only the internal flag of the printer and does not affect the print mode. This code becomes effective when the Elite-sized print mode is cancelled by the ESC P code.

See also ESC E and ESC M

Example

```
10 'Emphasized Mode
20 LPRINT CHR$(27);"E";
30 LPRINT "Emphasized";
40 LPRINT CHR$(27);"F";
50 LPRINT "     Pica-sized"
```

```
Emphasized     Pica-sized
```

ESC G

Name **ESC G** — Double-strike Mode Setting

Expression **CHR$(27);"G";**

Function Sets Double-strike print mode.

When this code is input, all the data stored in the printer buffer is printed out and then the data following this code is printed in Double-strike print mode.

In this mode, the printer will complete one line of printing by two passes of the print head while advancing the paper by about 1/216 inch between the first pass and the second pass. For this reason, the printer performs paper feeding adjustment to maintain the absolute length and number of lines of a page.
This eliminates the vertical gap between dots, thereby enabling high-quality printing.

See also ESC H

ESC H

Name **ESC H** — Double-strike Mode Cancel

Expression **CHR$(27);"H";**

Function Cancels Double-strike print mode.

The ESC H code cancels the Double-strike print mode set by the ESC G code.

See also ESC G

Example

```
10 'Double-strike Mode
20 LPRINT CHR$(27);"G";
30 LPRINT "Double Print"
40 LPRINT CHR$(27);"H";
50 LPRINT "Normal Print"
60 END
```

```
Double Print
Normal Print
```

ESC S

Name **ESC S** — Superscript/Subscript Mode Setting

Expression **CHR$(27);"S";CHR$(n);**
(1) n=0 or 48: Sets Superscript print mode.
(2) n=1 or 49: Sets Subscript print mode.

Function Sets Superscript/Subscript print mode.

(1) Sets Superscript print mode. (n=0 or 48)
When ESC S $(0)_D$ or ESC S $(48)_D$ code is input, all the data following this code is printed in Superscript print mode. In this mode, a character measuring 1.6 mm (H) is printed on the upper half of a line.

This code can be cancelled by input of the ESC T code.

See also ESC T

Example 1

```
10 'Superscript Mode
20 LPRINT CHR$(27);"E";
30 LPRINT "Y=aX";CHR$(27);"F";
40 LPRINT CHR$(27);"S";CHR$(0);CHR$(15);
50 LPRINT "3";
60 LPRINT CHR$(27);"T";CHR$(18);
70 LPRINT CHR$(27);"E";
80 LPRINT "+bX";CHR$(27);"F";
90 LPRINT CHR$(27);"S";CHR$(0);CHR$(15);
100 LPRINT "2";
110 LPRINT CHR$(27);"T";CHR$(18);
120 LPRINT CHR$(27);"E";
130 LPRINT "+cX+d"
```

$Y=aX^3+bX^2+cX+d$

(2) Sets Subscript print mode.
When ESC S $(1)_D$ or ESC S $(49)_D$ is input, the data following this code is printed in Subscript print mode. In this mode, a character measuring 1.6 mm (H) is printed on the lower half of a line.

This code can be cancelled by input of the ESC T code.

See also ESC T

Example 2

```
10 'Subscript Mode
20 LPRINT CHR$(27);"E";
30 LPRINT "H";CHR$(27);"F";
40 LPRINT CHR$(27);"S";CHR$(1);CHR$(15);
50 LPRINT "2";
60 LPRINT CHR$(27);"T";CHR$(18);
70 LPRINT CHR$(27);"E";
80 LPRINT "O"
```

H_2O

NOTE:
In both the Superscript and Subscript print modes, the printer will perform unidirectional, double-strike printing. After the first pass of the print head, the paper will be advanced by 1/216 inch and a character will be formed on completion of the second pass. For this reason, the printer will perform paper feeding adjustment to maintain the absolute length and number of lines of a page. Because of this adjustment, superscript or subscript characters may, in the worst case, be printed improperly.

ESC T

Name **ESC T** — Superscript/Subscript Mode Cancel

Expression **CHR$(27);"T";**

Function Cancels Superscript/Subscript print mode.

The ESC T code cancels the Superscript or Subscript print mode set by the ESC S code.

See also ESC S

BS

Name **BS** — Backspace

Expression **CHR$(8);**

Function Prints and backs by one character.

When this code is input, all the data stored in the print buffer is printed out and the next print start position returns to the left by one column.
In the Enlarged print mode, the print positions is backspaced by two pica-sized characters.
BS is not guaranteed when the print mode has been changed.

See also DEL

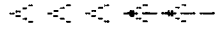
Example 1

```
10 'Backspace Ex. 1
20 LPRINT "YYYYY";
30 LPRINT CHR$(8);CHR$(8);
40 LPRINT "====="
```

```
YYY¥¥===
```

Example 2

```
10 'Backspace Ex. 2
20 LPRINT CHR$(27);"W";CHR$(1);
30 LPRINT "<<<<<";
40 LPRINT CHR$(8);CHR$(8);
50 LPRINT CHR$(27);"W";CHR$(0);
60 LPRINT "-----"
```



3.2.3 Selection of character set

ESC 4

Name **ESC 4** — Alternate Character Set Selection

Expression **CHR$(27);"4";**

Function Selects alternate character set.

Input of the ESC 4 code causes the data following this code to be printed in alternate characters. The italic characters are the standard alternate characters.

See also ESC 5

ESC 5

Name **ESC 5** — Alternate Character Set Cancel

Expression **CHR$(27);"5";**

Function Cancels alternate character set.

This code cancels the alternate character set by the ESC 4 code.

See also ESC 4

Example

```
10 'Alternate Character Set
20 LPRINT "Standard"
30 LPRINT
40 LPRINT CHR$(27);"4";
50 LPRINT "Alternate"
60 LPRINT
70 LPRINT CHR$(27);"5";
80 LPRINT "Standard"
90 END
```

Standard

Alternate

Standard

Code Table in Normal Mode

(U.S.A.)

	Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000			SP 32	0 48	@ 64	P 80	` 96	p 112	128	144	SP 160	° 176	À 192	Ð 208	à 224	ð 240
1	0001		17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	0010		DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	0011		19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	0100		DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	0101		21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	0110		22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	VT 139	ESC 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	¦ 124	FF 140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	1101	CR 13	29	- 45	= 61	M 77	] 93	m 109	} 125	CR 141	157	173	½ 189	Í 205	Ý 221	í 237	ý 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	SO 142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Code Table in Alternate Mode

(U.S.A.)

Hex. No. / Binary No.	0 0000	1 0001	2 0010	3 0011	4 0100	5 0101	6 0110	7 0111	8 1000	9 1001	A 1010	B 1011	C 1100	D 1101	E 1110	F 1111
0 0000			SP 32	Ø 48	@ 64	P 80	` 96	p 112	128	144	SP 160	Ø 176	@ 192	P 208	` 224	p 240
1 0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	! 161	1 177	A 193	Q 209	a 225	q 241
2 0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	" 162	2 178	B 194	R 210	b 226	r 242
3 0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	# 163	3 179	C 195	S 211	c 227	s 243
4 0100	4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	$ 164	4 180	D 196	T 212	d 228	t 244
5 0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	% 165	5 181	E 197	U 213	e 229	u 245
6 0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	& 166	6 182	F 198	V 214	f 230	v 246
7 0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	' 167	7 183	G 199	W 215	g 231	w 247
8 1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	(168	8 184	H 200	X 216	h 232	x 248
9 1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	) 169	9 185	I 201	Y 217	i 233	y 249
A 1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	* 170	: 186	J 202	Z 218	j 234	z 250
B 1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	VT 139	ESC 155	+ 171	; 187	K 203	[219	k 235	{ 251
C 1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	| 124	FF 140	156	, 172	< 188	L 204	\ 220	l 236	| 252
D 1101	CR 13	29	- 45	= 61	M 77	] 93	m 109	} 125	CR 141	157	- 173	= 189	M 205	] 221	m 237	} 253
E 1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	SO 142	158	. 174	> 190	N 206	^ 222	n 238	~ 254
F 1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	/ 175	? 191	O 207	_ 223	o 239	255

ESC R

Name **ESC R** — International Character Set Selection

Expression **CHR$(27);"R";CHR$(n);**
(0 ≤ n ≤ 10)

Function Selects international character set.

When the ESC R code is input, all data following this code is printed out in characters of the country specified by "n".
The specified country character set will be valid until specified by other ESC R code.

"n" represents one of the following country character sets.

n	Country
0	U.S.A.
1	France
2	Germany
3	England

n	Country
4	Denmark I
5	Sweden
6	Italy
7	Spain

n	Country
8	Japan
9	Norway
10	Denmark II

As for the specific code tables and character fonts, refer to Appendixes E, F and G.

(Normal Mode)

Hex	Dec	U.S.A	France	Germany	U.K.	Denmark I	Sweden	Italy	Spain	Japan	Norway	Denmark II
23	35	#	#	#	£	#	#	#	Pt	#	#	#
24	36	$	$	$	$	$	¤	$	$	$	¤	$
40	64	É	à	§	É	É	É	É	É	É	É	É
5B	91	[	°	Ä	[	Æ	Ä	°	¡	[	Æ	Æ
5C	92	\	Ç	Ö	\	Ø	Ö	\	Ñ	¥	Ø	Ø
5D	93	]	§	Ü	]	Å	Å	é	¿	]	Å	Å
5E	94	^	^	^	^	^	Ü	^	^	^	Ü	Ü
60	96	`	`	`	`	`	é	ù	`	`	é	é
7B	123	é	é	ä	é	æ	ä	à	¨	é	æ	æ
7C	124	ù	ù	ö	ù	ø	ö	ò	ñ	ù	ø	ø
7D	125	è	è	ü	è	å	å	è	è	è	å	å
7E	126	~	¨	ß	~	~	ü	ì	~	~	ü	ü

(Alternate mode)

Hex	Dec	U.S.A.	France	Germany	U.K.	Denmark I	Sweden	Italy	Spain	Japan	Norway	Denmark II
23	35	#	#	#	£	#	#	#	₧	#	#	#
24	36	$	$	$	$	$	¤	$	$	$	¤	$
40	64	@	à	§	@	@	É	@	@	@	É	É
5B	91	[	°	Ä	[	Æ	Ä	°	¡	[	Æ	Æ
5C	92	\	Ç	Ö	\	Ø	Ö	\	Ñ	¥	Ø	Ø
5D	93	]	§	Ü	]	Å	Å	é	¿	]	Å	Å
5E	94	^	^	^	^	^	Ü	^	^	^	Ü	Ü
60	96	`	`	`	`	`	é	ù	`	`	é	é
7B	123	{	é	ä	{	æ	ä	à	¨	{	æ	æ
7C	124	|	ù	ö	|	ø	ö	ò	Ñ	|	ø	ø
7D	125	}	è	ü	}	å	å	è	}	}	å	å
7E	126	~	¨	ß	~	~	ü	ì	~	~	ü	ü

Example

```
10 'International Character Set Selection
20 LPRINT CHR$(15);
30 FOR I=0 TO 10
40 LPRINT CHR$(27);"R";CHR$(I);
50 FOR J=33 TO 126
60 LPRINT CHR$(J);
70 NEXT
80 LPRINT
90 NEXT
```

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
!"#$%&'()*+,-./0123456789:;<=>?àABCDEFGHIJKLMNOPQRSTUVWXYZ°ç§^_`abçdefghijklmnopqrstuvwxyzéùè¨
!"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜ^_`abcdefghijklmnopqrstuvwxyzäöüß
!"£$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZÆØÅ^_`abcdefghijklmnopqrstuvwxyzæøå~
!"#¤%&'()*+,-./0123456789:;<=>?ÉABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÅÜ_éabcdefghijklmnopqrstuvwxyzäöåü
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ°\é^_ùabcdefghijklmnopqrstuvwxyzàòèì
!"£$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ¡Ñ¿^_`abcdefghijklmnopqrstuvwxyz¨ñ}~
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
!"#¤%&'()*+,-./0123456789:;<=>?ÉABCDEFGHIJKLMNOPQRSTUVWXYZÆØÄÜ_éabcdefghijklmnopqrstuvwxyzæøäü
!"#$%&'()*+,-./0123456789:;<=>?ÉABCDEFGHIJKLMNOPQRSTUVWXYZÆØÄÜ_éabcdefghijklmnopqrstuvwxyzæøäü
```

ESC m

Name **ESC m** — Special CG Selection

Expression **CHR$(27);"m";CHR$(n);**
(1) n=4: Selects graphic characters.
(2) n=0: Selects control codes.

Function Selects special CG (Character Generator).

(1) Selects graphic characters. (n=4)
Input of ESC m $(4)_D$ causes the printer to select graphic characters $(128)_D$ through $(159)_D$ on the character code table. The graphic characters are compatible with those of the EPSON HX-20 portable computer with 6 dots (W)×8 dots (H) fonts. (Refer to Appendixes F and G). For this reason, the RX printer can be used as the exclusive printer for the HX-20.

(2) Selects control codes.(n=0)
Input of ESC m $(0)_D$ causes the printer to select the standard control codes in $(128)_D$ through $(159)_D$ on the character code table.

Example

```
10 'Special CG Selection
20 LPRINT CHR$(27);"m";CHR$(4);
30 FOR I=128 TO 159
40 LPRINT CHR$(I);
50 NEXT
60 LPRINT CHR$(27);"m";CHR$(0);
70 END
```

3.2.4 Line spacing

ESC 0 (zero)

Name **ESC 0** (zero) — 1/8 inch Line Spacing

Expression **CHR$(27);"0";**

Function Sets 1/8 inch line spacing.

Input of the ESC 0 code causes the subsequent line spacing to be set at 1/8 inch.

See also ESC 1, ESC 2, ESC 3 and ESC A

Example

```
10 '1/8 inch Line Spacing
20 LPRINT CHR$(27);"0";
30 FOR I=1 TO 5
40 LPRINT "1/8 inch Line Spacing"
50 NEXT
60 END
```

```
1/8 inch Line Spacing
1/8 inch Line Spacing
1/8 inch Line Spacing
1/8 inch Line Spacing
1/8 inch Line Spacing
```

ESC 1

Name **ESC 1** — 7/72 inch Line Spacing

Expression **CHR$(27);"1";**

Function Sets 7/72 inch line spacing.

Input of the ESC 1 code causes the subsequent line spacing to be set at 7/72 inch.

See also ESC 0, ESC 2, ESC 3 and ESC A

Example

```
10 '7/72 inch Line Spacing
20 LPRINT CHR$(27);"1";
30 FOR I=1 TO 5
40 LPRINT "7/72 inch Line Spacing"
50 NEXT
60 END
```

```
7/72 inch Line Spacing
7/72 inch Line Spacing
7/72 inch Line Spacing
7/72 inch Line Spacing
7/72 inch Line Spacing
```

NOTE:
7/72 inch line spacing causes no space between characters in two succeeding lines.

ESC 2

Name **ESC 2** — 1/6 inch Line Spacing

Expression **CHR$(27);"2";**

Function Sets 1/6 inch line spacing.

Input of the ESC 2 code causes the subsequent line spacing to be set at 1/6 inch.

See also ESC 0, ESC 1, ESC 3 and ESC A

Example

```
10 '1/6 inch Line Spacing
20 LPRINT CHR$(27);"2";
30 FOR I=1 TO 5
40 LPRINT "1/6 inch Line Spacing"
50 NEXT
60 END
```

```
1/6 inch Line Spacing
1/6 inch Line Spacing
1/6 inch Line Spacing
1/6 inch Line Spacing
1/6 inch Line Spacing
```

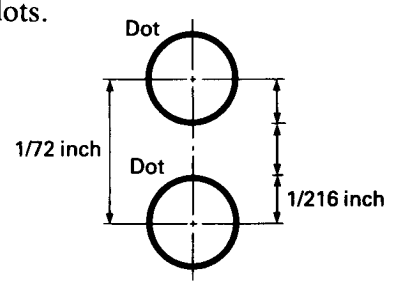
ESC 3

Name **ESC 3** — n/216 inch Line Spacing

Experssion **CHR$(27);"3";CHR$(n);**
(0 ≤ n ≤ 255)

Function Sets n/216 inch line spacing.

This code sets the amount of line spacing in units of 1/3 of the space adjacent dots.



Input of the ESC 3 $(n)_D$ code causes the subsequent line spacing to be set at n/216 inch.

See also ESC 0, ESC 1, ESC 2 and ESC A

Example To set 20/216 (5/54) inch line spacing,

```
10 'n/216 inch Line Spacing
20 LPRINT CHR$(27);"3";CHR$(20);
30 FOR I=1 TO 5
40 LPRINT "20/216 inch Line Spacing"
50 NEXT
60 END
```

```
20/216 inch Line Spacing
20/216 inch Line Spacing
20/216 inch Line Spacing
20/216 inch Line Spacing
20/216 inch Line Spacing
```

NOTE:
With n=1 and n=2, paper feeding accuracy is not guaranteed.

ESC A

Name **ESC A** — n/72 inch Line Spacing

Expression **CHR$(27);"A";CHR$(n);**
(0 ≤ n ≤ 85)

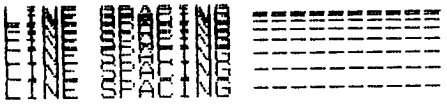
Function Sets n/72 inch line spacing.

This code sets the amount of line spacing to n/72 inch. When n=1 (i.e., 1/72 inch), the amount of line spacing equals the space between two adjacent dot wires in the print head.

See also ESC 0, ESC 1, ESC 2 and ESC 3

Example

```
10 'Line Spacing by dots
20 FOR I=1 TO 8
30 LPRINT CHR$(27);"A";CHR$(I);
40 LPRINT "LINE SPACING ----------"
50 NEXT
60 END
```



3.2.5 Format control

HT

Name **HT** — Horizontal TAB

Expression **CHR$(9);**

Function Horizontal Tabulation

This code carries out the horizontal TAB to the predetermined horizontal TAB unit set by ESC e code. When the power is turned ON, TAB is automatically set every 8 characters. When multiple HT codes are input, the horizontal TAB is carried out to the position of the horizontal TAB unit multiplied by the number of the input HT coes.

See also ESC e

Example

```
10 'Horizontal TAB
20 LPRINT "01234567890123456789012345678 9"
30 FOR I=1 TO 5
40 LPRINT CHR$(9);"TAB";
50 NEXT
```

```
01234567890123456789012345678 9
          TAB     TAB     TAB     TAB     TAB
          ↑       ↑                       ↑
TAB set   Column 0  Column 8               Column 40
```

NOTES:

1. *If the print position set by inputting this code exceeds the column end, the print data is printed out at the column head of the next line.*

2. *When the left margin is changed by ESC l code, the new left margin becomes the start position of the horizontal TAB.*

3. *This code may not be used in certain versions of the Microsoft BASIC. In such cases, use CHR$(137) instead.*

VT

Name **VT** — Vertical TAB

Expression **CHR$(11);**

Function Vertical Tabulation

When this code is input, all the data stored in the print buffer is printed out and then line feed is carried out to the predetermined vertical TAB unit set by ESC e code.
If the vertical TAB unit is not predetermined, this code functions the same as LF code.
When multiple VT codes are input, the vertical TAB is carried out to the position of the vertical TAB unit multiplied by the number of the input VT codes.

See also ESC e

Example

```
10 'Vertical TAB
20 LPRINT CHR$(27);"e";CHR$(1);CHR$(2);
30 LPRINT "VT";
40 LPRINT CHR$(11);"VT";
50 LPRINT CHR$(11);CHR$(11);"VT";
60 LPRINT CHR$(11);CHR$(11);CHR$(11);"VT";
```

```
VT

VT


VT



VT
```

NOTE:
This code cancels the Enlarged print mode set by the SO code.

ESC e

Name **ESC e** — TAB Unit Setting

Expression **CHR$(27);"e";CHR$(n);CHR$(m);**
(1) n=0 or 48: Sets horizontal TAB unit.
(2) n=1 or 49: Sets vertical TAB unit.

Function Sets horizontal/vertical TAB unit.

(1) Horizontal TAB unit setting (n=0 or 48)
When ESC e $(0)_D$ $(m)_D$ or ESC e $(48)_D$ $(m)_D$ code is input, the horizontal TAB is set at the position which is m times the number of characters (of the character mode) from the column head determined by ESC l. The horizontal TAB unit is stored as the amount which is m times the character size of the character mode.
The minimum value of m is 0. When m is 0, the HT is ignored. The default value of m is 8. The maximum value of m to be set at each mode is:

21 for Pica-sized
25 for Elite-sized
36 for Condensed
21 for Emphasized

When the Enlarged print mode is set for the above characters, the maximum value for m is one half of the maximum value for each character.

See also HT

Example 1

```
10 'Horizontal TAB Unit Setting
20 LPRINT "012345678901234567890123456789012345678901234567890123456789"
30 LPRINT CHR$(27);"e";CHR$(0);CHR$(5);
40 LPRINT CHR$(9);"Stop!";
50 LPRINT CHR$(9);CHR$(9);"Stop!";
60 LPRINT CHR$(9);CHR$(9);CHR$(9)";"STOP!"
70 END


012345678901234567890123456789012345678901234567890123456789
     Stop!          Stop!                    Stop!
```

Example 2

```
10 'Horizontal TAB Unit Setting
20 LPRINT CHR$(15);
30 LPRINT "01234567890123456789012345678901234567890123456789"
40 LPRINT CHR$(27);"e";CHR$(0);CHR$(5);
50 LPRINT CHR$(18);
60 LPRINT CHR$(9);"Stop!";
70 LPRINT CHR$(9);CHR$(9);"Stop!";
80 LPRINT CHR$(9);CHR$(9);CHR$(9);"Stop!"
90 LPRINT "01234567890123456789012345678901234567890123456789"
100 END
```

```
01234567890123456789012345678901234567890123456789
    Stop!     Stop!          Stop!
01234567890123456789012345678901234567890123456789
```

NOTE:
Since the horizontal TAB unit is stored as an absolute length, this TAB unit will not change even if you change the print mode.

(2) Vertical TAB unit setting (n=1 or 49)
When ESC e $(1)_D$ $(m)_D$ or ESC e $(49)_D$ $(m)_D$ is input, the vertical TAB is set at the position which is m times one line spacing from the Top of form in effect at that time.
The vertical TAB unit is stored as the amount which is m times one line spacing.
When m is 0, input of this code causes print only.
The maximum length for a vertical TAB unit is the form length and if a vertical TAB unit is set exceeding the form length, the setting will be ignored.

See also VT

Example

```
10 'Vertical TAB
20 LPRINT CHR$(27);"e";CHR$(1);CHR$(2);
30 LPRINT CHR$(27);"W";CHR$(1);
40 LPRINT "VT";
50 LPRINT CHR$(11);"VT";
60 LPRINT CHR$(11);CHR$(11);"VT";
70 LPRINT CHR$(11);CHR$(11);CHR$(11);"VT";
```

```
VT
VT

VT


VT
```

Compare this program with that of VT code.

NOTE:
Since the vertical TAB unit is stored as an absolute value, this TAB unit will not change even if you change the line spacing.

ESC f

Name **ESC f** — Skip Position Setting

Expression **CHR$(27);"f";CHR$(n);CHR$(m);**
(1) n=0 or 48: Sets horizontal skip position.
(2) n=1 or 49: Sets vertical skip position.

Function Sets horizontal/vertical skip position.

(1) Horizontal skip position setting (n=0 or 48)
When ESC f $(0)_D$ $(m)_D$ or ESC f $(48)_D$ $(m)_D$ code is input, space is skipped by m number of characters. ($0 \leqslant m \leqslant 127$)

Example 1
```
10 'Horizontal Skip Position Setting
20 LPRINT "EPSON";
30 LPRINT CHR$(27);"f";CHR$(0);CHR$(5);
40 LPRINT "WORLD";
```

```
EPSON      WORLD
```

(2) Vertical skip position setting (n=1 or 49)
When ESC f $(1)_D$ $(m)_D$ or ESC f $(49)_D$ $(m)_D$ code is input, the paper is fed by m number of lines. ($0 \leqslant m \leqslant 127$)

Example 2
```
10 'Vertical Skip Position Setting
20 LPRINT "EPSON";
30 LPRINT CHR$(27);"f";CHR$(1);CHR$(5);
40 LPRINT "WORLD";
```

```
EPSON

     WORLD
```

ESC C

Name **ESC C** — Form Length Setting

Expression (1) Specification by number of lines:
CHR$(27);"C";CHR$(n);
(1 ≤ n ≤ 127)

(2) Specification by inch:
CHR$(27);"C";CHR$(0);CHR$(n);
(1 ≤ n ≤ 22)

Function Sets form length.

(1) The ESC C $(n)_D$ code changes the form length by n number of lines. The form length is the amount of one line spacing multiplied by n (lines).

Example 1 Set the form length to 50 lines.

```
LPRINT CHR$(27);"C";CHR$(50);
```

(2) When ESC C $(0)_D$ $(n)_D$ code is input, the form length specified in inches is set. The form length is n inches.

Example 2

```
10 LPRINT CHR$(27);"C";CHR$(0);CHR$(1);
20 LPRINT "Dear Sirs,";
30 LPRINT CHR$(12);
40 LPRINT "etc.";
```

```
Dear Sirs,



etc.
```

NOTES:

1. *The printer updates the data for the form length setting by designating the position when the code is input as the Top of form position.*
2. *Form feed, skip-over perforation, etc., are carried out in accordance with the form length set by this code.*
3. *The form length will be stored as an absolute length. Therefore, the specified form length will not change after it has once been set even if the amount of line spacing is changed.*

ESC N

Name **ESC N** — Skip-over Perforation Setting

Expression **CHR$(27);"N";CHR$(n);**
(1 ≤ n ≤ 127)

Function Sets skip-over perforation.

The ESC N code is used to set the skip-over perforation function, which specifies the number of lines "n" to be skipped at the bottom of a form.

For example, if the last three lines of a form is to be skipped, the value of n must be entered as 3.

When the current form length is changed by the input of the ESC C code again, the specified amount of skip-over perforation is cancelled. In this case, therefore, the ESC N code must be input again to set the amount of skip-over perforation.
When the DIP switch pin 2-4 is ON, 1-inch skip-over perforation is executed.
A setting of the skip-over perforation of which the value exceeds the length of the form is ignored.

See also ESC O and ESC C

Example

```
10 'Skip-over Perforation
20 LPRINT CHR$(27);"C";CHR$(5);
30 LPRINT CHR$(27);"N";CHR$(2);
40 FOR I=1 TO 9
50 LPRINT "Let's count     ";I
60 NEXT
70 END
```

```
Let's count      1
Let's count      2
Let's count      3


Let's count      4
Let's count      5
Let's count      6


Let's count      7
Let's count      8
Let's count      9
```

<Skip-Over Perforation>

For example, if you are using 11-inch paper and you set a skip-over perforation of 6 lines, the printer will print 60 lines from the top of form position, feed for 6 lines and then continue printing from the 61st line of data at the top of form position of the next page.

The top of form position is the position of the first print line on the form when the power switch is turned ON, or the position when the form length is set by an ESC C code.

ESC O

Name **ESC O** — Skip-over Perforation Cancel

Expression **CHR$(27);"O";**

Function Cancels skip-over perforation.

This code cancels the skip-over perforation set by the ESC N code.

See also ESC N

Example

```
10 'Skip-over Perforation Cancel
20 LPRINT CHR$(27);"C";CHR$(3);
30 LPRINT CHR$(27);"N";CHR$(2);
40 LPRINT "Twinkle twinkle"
50 LPRINT "       little star"
60 LPRINT "  *! *! *! *! *! *! "
70 LPRINT CHR$(27);"O";
80 LPRINT "Twinkle twinkle"
90 LPRINT "       little star"
100 LPRINT "  *! *! *! *! *! *!"
```

```
Twinkle twinkle

       little star

  *! *! *! *! *! *!

Twinkle twinkle
       little star
  *! *! *! *! *! *!
```

ESC Q

Name **ESC Q** — Right Margin

Expression **CHR$(27);"Q";CHR$(n);**

Function Sets column end.

This code specifies the right margin, i.e., the right end of the print area is changed.
The length from the left end of the column to the right end is the character width (character size), when this code is input, multiplied by n. This code must be specified at the head of a line. There are maximum and minimum values for n in each print mode and if their range as below is exceeded, n will be ignored and the previous setting will remain in effect.

$2 \leqslant n \leqslant 80$	Pica-sized mode and Emphasized mode
$4 \leqslant n \leqslant 137$	Condensed mode
$3 \leqslant n \leqslant 96$	Elite-sized mode

When the Enlarged print mode is set, n for each mode will be half of the values above.

See also ESC l

Example

```
10 LPRINT CHR$(27);"Q";CHR$(15);
20 LPRINT "12345678901234567890123456789O"
30 END
```

```
123456789012345
67890123456789O
```

NOTES:

1. *If the right or left margin is not specified, the buffer full position in Condensed mode is set to 132 columns which is 5 characters less than that in Normal mode. However, when the right or left margin is set by the ESC Q or ESC l code, condensed characters are printed up to the specified print column width in the same manner as in Pica-sized character mode.*
   For details, refer to "Buffer-Full Print" on page 3-2.
2. *If this code is not specified at the head of a line, the print data prior to this code may be lost.*

ESC l

Name **ESC l** — Left Margin

Expression **CHR$(27);"l";CHR$(n);**

Function Sets column head.

This code sets the position of the column head in the current character size. The difference of functions between ESC Q and ESC l is that ESC Q sets the column end and ESC l, the column head.

$0 \leqslant n \leqslant 78$	Pica-sized mode and Emphasized mode
$0 \leqslant n \leqslant 134$	Condensed mode
$0 \leqslant n \leqslant 93$	Elite-sized mode

See also ESC Q

Example 1 To set the left margin to the 8th column.

```
10 'Left Margin
20 LPRINT "01234567890123456789"
30 LPRINT CHR$(27);"l";CHR$(8);
40 LPRINT
50 LPRINT "The Message from EPSON."
```

```
01234567890123456789
        The Message from EPSON.
```

Example 2

```
10 'Horizontal TAB & ESC l
20 GOSUB 100
30 LPRINT CHR$(27);"l";CHR$(15);
40 GOSUB 100
50 END
100 LPRINT "01234567890123456789O"
110 LPRINT CHR$(27);"e";CHR$(0);CHR$(5);
120 LPRINT "TAB";CHR$(9);"TAB";
130 LPRINT CHR$(9);CHR$(9);"TAB";
140 LPRINT CHR$(9);CHR$(9);CHR$(9);"TAB"
150 RETURN
```

```
01234567890123456789O
TAB  TAB       TAB            TAB
               01234567890123456789O
               TAB  TAB       TAB            TAB
```

NOTE:
Input of the ESC l code causes the horizontal TAB positions previously set to be cleared and the subsequent horizontal TAB setting is carried out assuming the start column position set by the ESC l as position 0.

3.2.6 Input data control

DEL

Name **DEL** — Delete

Expression **CHR$(127);**

Function Cancels last printable data.

Input of the DEL code causes the last printable data stored in the print buffer to be deleted.
This code is ignored in the Bit image mode.

See also BS

Example 1

```
10 'Delete Ex.1
20 LPRINT "Delete";
30 LPRINT CHR$(127);
40 LPRINT "ing"
```

```
Deleting
```

Example 2

```
10 'Delete Ex.2
20 LPRINT "DELETE";
30 LPRINT CHR$(127);CHR$(127);CHR$(127);
```

```
DEL
```

3.2.7 Miscellaneous

BEL

Name **BEL** — Bell

Expression **CHR$(7);**

Function Sounds the buzzer.

When the BEL code is input, the buzzer sounds for approximately 0.2 second.

Example

```
LPRINT CHR$(7);
```

<beep>

NOTE:
To disable the buzzer, set DIP switch pin 1-3 to the ON position.

ESC 8

Name **ESC 8** — Paper-end Detector Ignore

Expression **CHR$(27);"8";**

Function Ignores paper-end signal.

Input of this code enables the printer to print data to the last line of the paper when the paper is nearing its end.
With the DIP switch pin 1-5 on the control circuit board set to the ON position, the printer is placed in the ESC 8 condition upon application of power.

See also ESC 9

NOTE:
If the ESC 8 code is transferred after the printer falls into paper-out status, the paper-end error cannot be released.

ESC 9

Name **ESC 9** — Paper-end Detector Enable

Expression **CHR$(27);"9";**

Function Enables paper-end signal.

This code cancels the ESC 8 condition so that the printer cannot continue printing and will enter the OFF-LINE state if there is no paper in the printer. (In this case, insert paper in the printer and press the ON-LINE switch. Printing will then be resumed.)
With the DIP switch pin 1-5 set to the OFF position, the printer is placed in the ESC 9 condition upon application of power.

See also ESC 8

ESC <

Name **ESC <** — One line unidirectional printing

Expression **CHR$(27);"<";**

Function Prints current line only from left to right.

When this code is input, the print head returns to its leftmost position and data is printed from left to right for one line.

See also ESC U

Example

```
10 'Let's see ESC <
20 LPRINT "              Ah, well."
30 LPRINT CHR$(27);"<";
```

```
Ah, well.
```

NOTE:
The ESC < code minimizes horizontal dot aberrations which may be caused by the printing mechanism. ESC < is the command which causes the print head to return to its leftmost position only once, while ESC U causes all the following data to be printed unidirectionally.
Though usual bidirectional printing causes hardly any horizontal dot aberration, use of these two commands is recommended for greater precision.

ESC @

Name **ESC** @ — Printer Intialization

Expression **CHR$(27);"@";**

Function Initializes the printer.

When this code is input, the printer is initialized, i.e., the same status as when the power of the printer is turned ON, causing all the data in the print buffer to be cleared.

Example

```
10 LPRINT CHR$(27);"4";
20 LPRINT "Walk on the moon"
30 LPRINT
40 LPRINT CHR$(27);"@";
50 LPRINT "Walk on the moon"
60 END
```

Walk on the moon

Walk on the moon

ESC U

Name **ESC U** — Unidirectional Printing

Expression **CHR$(27);"U";CHR$(n);**
(1) n=1 or 49 Unidirectional printing
(2) n=0 or 48 Bidirectional printing (except in Bit image mode)

Function Sets/cancels unidirectional printing.

(1) Unidirectional printing (n=1 or 49)
When ESC U $(1)_D$ or ESC U $(49)_D$ is input, all data following this code will be printed only when the print head is moving unidirectionally from left to right. Unidirectional printing is effective to further improve the precision of vertical character alignment.

(2) Bidirectional printing (n=0 or 48)
When the ESC U $(0)_D$ or ESC U $(48)_D$ code is input, the unidirectional print mode is cancelled and the printer returns to the normal bidirectional print mode.

See also ESC <

Example

```
10 LPRINT "Let's see."
20 LPRINT CHR$(27);"U";CHR$(1);
30 LPRINT "Let's see."
40 LPRINT CHR$(27);"U";CHR$(0);
50 LPRINT "Let's see."
60 END
```

```
Let's see.
Let's see.
Let's see.
```

ESC s

Name **ESC s** — Half Speed Printing

Expression **CHR$(27);"s";CHR$(n);**
(1) n=1 or 49: Sets Half speed printing.
(2) n=0 or 48: Cancels Half speed printing.

Function Sets/cancels half speed printing.

(1) Sets half speed printing. (n=1 or 49)
When ESC s $(1)_D$ or ESC s $(49)_D$ code is input, the print speed decreases from normal 100 cps (character per second) to 50 cps. This is effective to reduce print noise.

(2) Cancels half speed printing. (n=0 or 48)
When ESC s $(0)_D$ or ESC s $(48)_D$ code is input, the print speed returns to normal 100 cps.

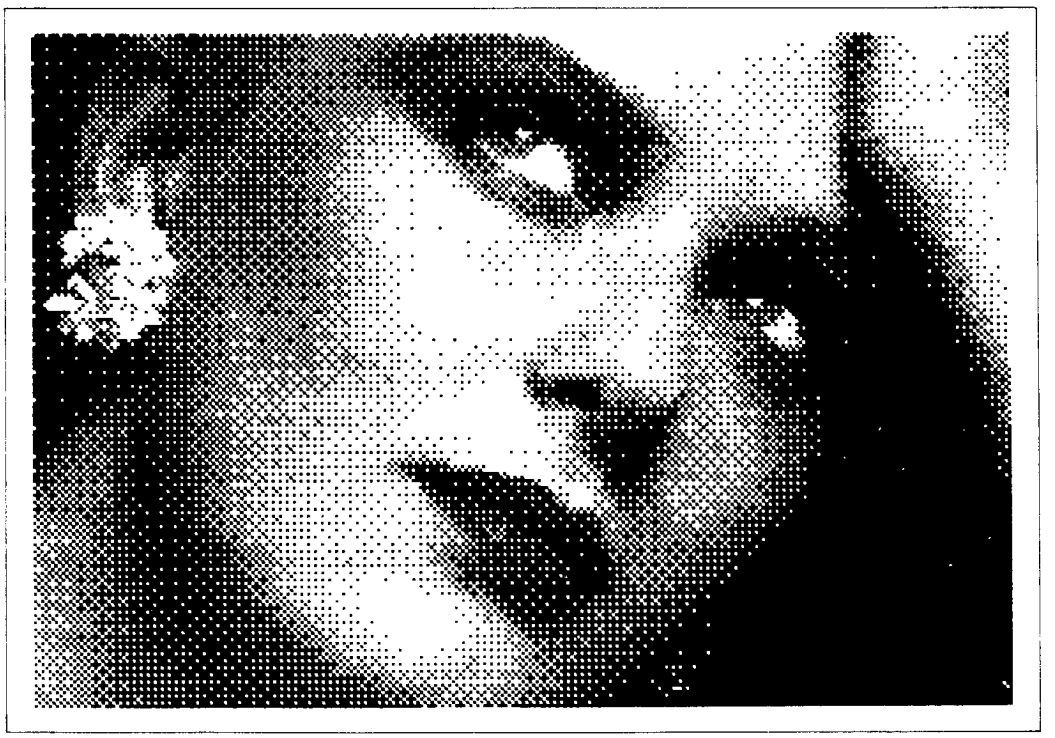
3.3 Control Codes in the Bit Image Mode

The Bit Image Mode is set by the following codes.

ESC K, ESC L, ESC Y, ESC Z, ESC *

Once the Bit image mode is entered, all the data is recognized as bit-image data until the specified number of data (specified by n_1 and n_2, to be described later) is received. After the specified number of data is recieved, the printer returns to the Text mode.

As for the format to set the Bit image mode, the method to specify the number of data (how to determine the values of n_1 and n_2), etc., the codes ESC K (Normal-density bit image mode) and ESC L (Dual-density bit image mode) are taken as examples but the format and the method are the same for the codes ESC Y, ESC Z and ESC *.



This print example is made using APPLE II computer and the demonstration diskette.

ESC K

Name **ESC K** — Normal-density Bit Image Mode

Expression **CHR$(27);"K";CHR$(n_1);CHR$($n_2$);**
CHR$($d_1$);CHR$(d_2);...CHR$($Dn_1$, n_2). ← *Bit-image data*

Function Sets Normal-density bit image mode. (The maximum number of bit-image data per line is 480.)

This code sets Normal-density bit image mode. When this code is input, the data following ESC K code is printed out as dot pattern(s).

See also ESC L, ESC Y, ESC Z and ESC *

<How to obtain n_1 and n_2>

The number of bit image data will be sent in hexadecimal or decimal numbers n_1 and n_2.

If the number of bit image data is 300, then n_1 and n_2 may be derived as follows;

n_1=(Number of data) MOD 256
=300 MOD 256
=$(44)_D$
=$<2C>_H$

n_2=INT (Number of data/256)
=INT (300/256)
=$(1)_D$
=$<01>_H$

n_1 is the remainder of (Number of data) over 256, and n_2 is the quotient of (Number of data) over 256.

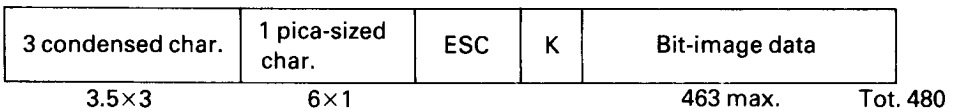
In the Normal-density bit image mode, the maximum number of dot positions printable per line is 480. Therefore, the values of n_1 and n_2 specified in excess of 480 dot positions are ignored and printing of the bit image data after the 480th dot position is not guaranteed. Mixing of text data and bit image data is possible on the same line.

When text data and bit-image data are mixed on a line, it is necessary to take into account that the amount of printable bit-image data decreases due to print in Text mode.

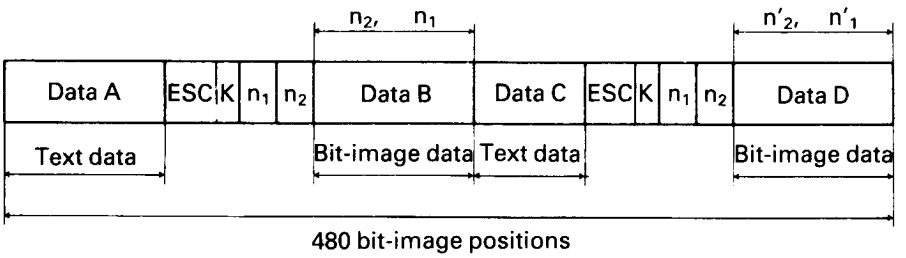
Print mode	No. of bit-image data decrease per 1 char.
Pica-sized, Emphasized	6
Condensed	3.5
Elite-sized	5

(When the Enlarged print mode is set, the decrease in the amount of bit-image data printable per character of Text mode is twice that of the above modes.)

(Ex. 1)
The number of bit-image data printable on a line by the ESC K code after 3 condensed and 1 pica-sized characters are printed out is 463 (480−(3.5×3)+6×1). (Fraction is rounded off.)

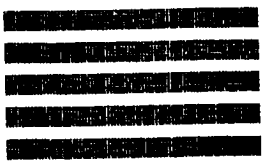


(Ex. 2)
The following operation is possible in mixed use of Text mode and Bit-image mode on a line.



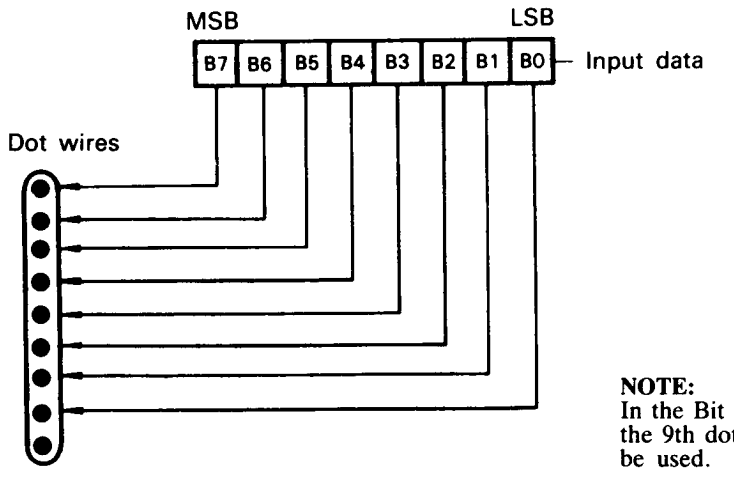
To check for proper conversion to the Normal-density bit image mode, execute the following program.

```
10 'Normal-density Bit Image Mode
20 FOR I=1 TO 5
30 LPRINT CHR$(27);"K";CHR$(80);CHR$(0);
40 FOR N=1 TO 80
50 LPRINT CHR$(255);
60 NEXT
70 LPRINT
80 NEXT
90 END
```



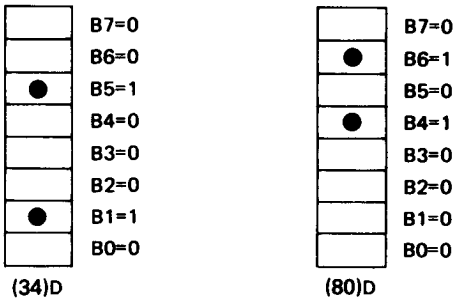
<Relationship between bit-image data and dot wires>

The figure below shows the relationship between the bit image data and the dot wires in the print head.
You can arbitrarily control the 8 dot wires in the print head.



Relationship between Data and Dot Wires

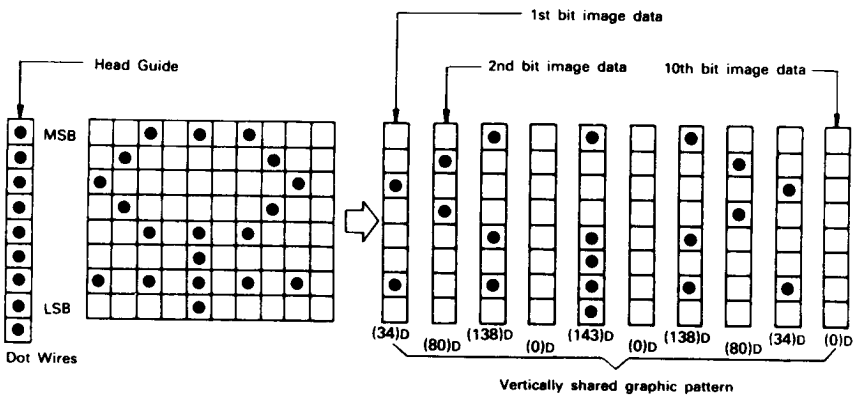
If a bit is 1, the print head fires. If a bit is 0, the print head does not fire. For example, assume that data are given as follows;



where a box with "●" denotes the bit 1 and a blank box denotes the bit 0. According to Appendix E, Code Tables, you can define $(00100010)_2$ as $(34)_D$ or $<22>_H$ and $(01010000)_2$ as $(80)_D$ or $<50>_H$.
As you can see, the first 4 bits are defined from column and the second 4 bits are defined from row. Namely,

$(0101)_2 = (5)_D = <05>_H$ and $(0000)_2 = (0)_D = <00>_H$.

Example 1



Example of Graphic Pattern Formation

NOTE:
The most significant bit (MSB) of the bit image data corresponds to the dot wire at the uppermost position.

For example, to print a graphic data as above, a program such as shown below must be executed.

```
10 'Bit-Image Printing (Normal density)
20 LPRINT CHR$(27);"K";CHR$(10);CHR$(0);
30 FOR I=1 TO 10
40 READ R
50 LPRINT CHR$(R);
60 NEXT
70 LPRINT
80 DATA 34,80,138,0,143,0,138,80,34,0
90 END
```

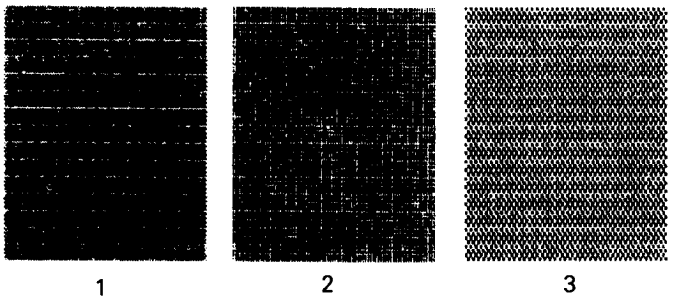
This program has been developed using standard BASIC language. If extended BASIC is to be used, the program must be changed according to the features of the language.
In addition, if data is to be transferred through an interpreter of BASIC, etc., the data transfer rate becomes extremely slow. In such a case, it is recommended to effect the data transfer through machine language, etc.

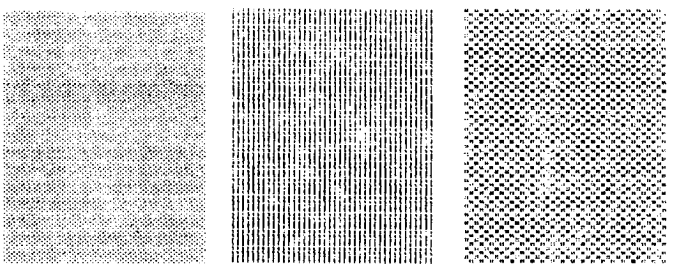
Example 2

```
10 'Bit-Image Printing (Normal density)
20 LPRINT CHR$(27);"K";CHR$(12);CHR$(0);
30 FOR I=1 TO 12
40 READ R
50 LPRINT CHR$(R);
60 NEXT
70 LPRINT
80 DATA 4,10,26,58,103,231
90 DATA 231,103,58,26,10,4
100 END
```

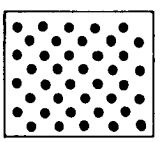
Example of expression of brightness using the Bit image mode

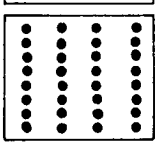
(Ex.) Expression of brightness

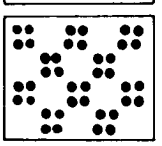




(Ex.) Expression of dot density

A: 
Data will be transmitted in order of
$(170)_D$ and then $(85)_D$
(8-dot line spacing)

B: 
Data will be transmitted in order of
$(255)_D$ and then $(0)_D$
(8-dot line spacing)

C: 
Data will be transmitted in order of two
$(204)_D$ and then two $(51)_D$
(8-dot line spacing)

Examples of Expression of Brightness

ESC L

Name **ESC L** — Dual-density Bit Image Mode

Expression **CHR$(27);"L";CHR$(n_1);CHR$($n_2$);**
CHR$($d_1$);CHR$(d_2);...CHR$($Dn_1$, n_2) ← *Bit-image data*

Function Sets Dual-density bit image mode. (The maximum number of bit-image data per line is 960.)

This code sets the Dual-density bit image mode. The dot pattern indicated by n_1 and n_2 following ESC L will be printed in dual density.
Refer to the description of ESC K code for detailed information as to how to obtain the values of n_1 and n_2.

The transfer sequence of bit image data is the same as with the ESC K (normal-density bit image printing), but bit image printing can be performed in twice the dot density in the horizontal direction as with the ESC K. In other words, bit image data can be printed in 960 dot positions per line, thus permitting to produce denser graphic data.

If data above this amount is specified, the excess will be ignored. After the completion of bit image printing, the printer will automatically return to Text mode.

Mixing of normal-density bit image with dual-density bit image on a line is at your option, as well as mixing with the characters in Text mode.

When the characters in the Text mode and dual-density bit image are mixed on a line, the amount by which the bit-image data decreases is twice that of normal-density bit image (ESC K). The print speed decreases from the normal 10 IPS to 5 IPS (inch per second).

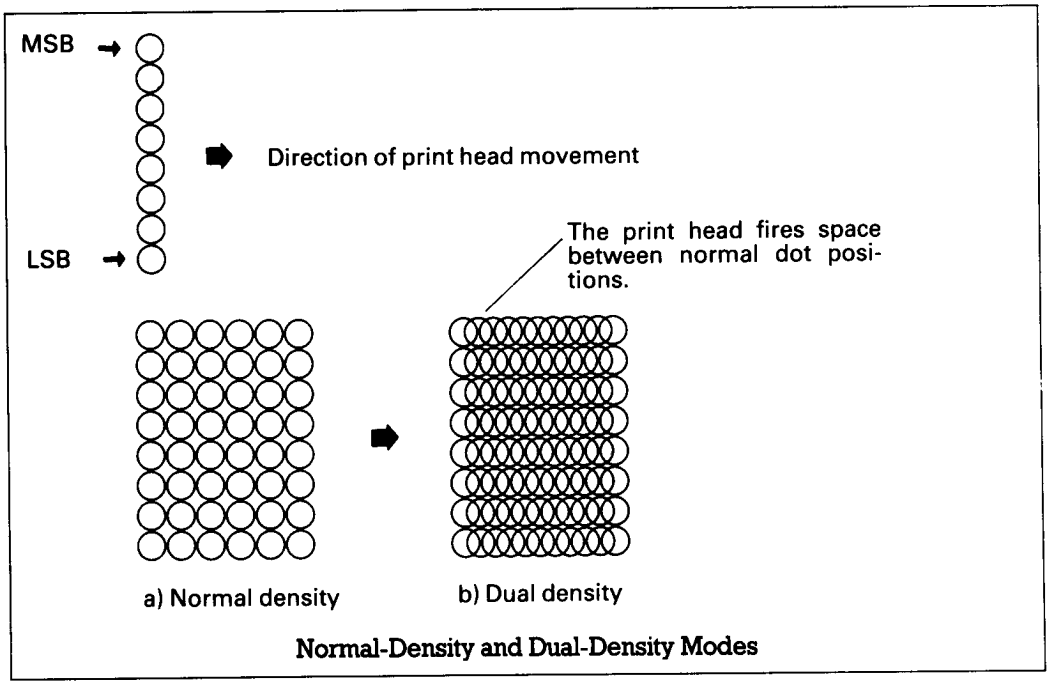
See also ESC K, ESC Y, ESC Z and ESC *

Example The number of bit-image data printable on a line by the ESC L code after 3 condensed and 1 pica-sized characters are printed out is 927 (960−{2×(3.5×3+6×1)}).

3 condensed char.	1 pica-sized char.	ESC	L	Bit-image data
No. of data regarded as bit-image data ➡ (3.5×3)×2	(6×1)×2			927 max. Tot. 960

<Difference between ESC K and ESC L>

The Normal-density mode is accessed with ESC K. The Dual-density mode is accessed with ESC L.



Normal-Density and Dual-Density Modes

NOTE:
Print alignment under the friction feed.
Due to the nature of friction feed in which paper may slip, it is not available to use the bit-image mode while feeding the cut sheet or the roll paper in the RX-80 F/T. If the accuracy of line feed is critical, the pin-feed paper must be used.

Example 1

```
10 'Dual-density Bit Image Mode
20 FOR I=1 TO 5
30 LPRINT CHR$(27);"L";CHR$(80);CHR$(0);
40 FOR N=1 TO 80
50 LPRINT CHR$(255);
60 NEXT
70 LPRINT
80 NEXT
90 END
```

Example 2

```
10 'Dual-density Bit Image Mode
20 LPRINT CHR$(27);"L";CHR$(10);CHR$(0);
30 FOR I=1 TO 10
40 READ R
50 LPRINT CHR$(R);
60 NEXT
70  DATA 34,80,138,0,143,0,138,80,34,0
80 END
```

♀

ESC Y

Name **ESC Y** — Double-speed, Dual-density Bit Image Mode

Expression **CHR$(27);"Y";CHR$(n_1);CHR$($n_2$);**
CHR$($d_1$);CHR$(d_2);...CHR$($Dn_1$, n_2) ← *Bit-image data*

Function Sets Double speed, Dual-density bit image mode. (The maximum number of bit-image data per line is 960.)

When Dual-density bit image mode (ESC L) is entered, the print speed decreases from the normal 10 IPS to 5 IPS (inch per second). If the ESC Y code is used, however, normal print speed is enabled and bit-image data of 960-position/8 inch is printed out. Horizontally adjacent dots cannot be printed.
For the procedure to obtain n_1 and n_2, refer to the description of the ESC K code.

See also ESC K, ESC L, ESC Z and ESC *

ESC Z

Name **ESC Z** — Quadruple-density Bit Image Mode

Expression **CHR$(27);"Z";CHR$(n_1);CHR$($n_2$);**
CHR$($d_1$);CHR$(d_2);...CHR$($Dn_1$, n_2) ← *Bit-image data*

Function Sets Quadruple-density bit image mode. (The number of bit-image data per line is 1,920.)

When this code is input, the printer performs quadruple-density bit image printing. However, horizontally adjacent dots cannot be printed in this mode.

For the procedure to obtain the values of n_1 and n_2, refer to ESC K.

The print speed is 5 IPS (inch per second), the same as that of Dual-density bit image mode (ESC L).

See also ESC K, ESC L, ESC Y and ESC *

ESC *

Name **ESC *** — Bit Image Mode Selection

Expression **CHR$(27);"*";CHR$(m);CHR$($n_1$);CHR$(n_2);**
CHR$($d_1$);CHR$(d_2);...CHR$($Dn_1$, n_2) ← *Bit-image data*

Function This code selects Bit image mode.

m	Mode	Max. Position/8"	Head Speed (inch/sec)	Other code with same function
0	Normal density	480	10	ESCK
1	Dual density	960	5	ESCL
2	Double-speed, Dual-density	960	10	ESCY
3	Quadruple-density	1920	5	ESCZ
4	CRT Graphics	640	5	—
6	CRT Graphics II	720	5	—

For the procedure to obtain n_1 and n_2, refer to ESC K. If the value specified for m is not in the range 0 to 4 or 6, the specified number of data will be ignored.
When m is 2 or 3, the horizontally adjacent dots cannot be printed. m=4 is optimal to take hard copy of CRT data.

```
10 LPRINT CHR$(27);"*";CHR$(0);CHR$(0);CHR$(1);
20 FOR I=1 TO 256: LPRINT "x";: NEXT
30 LPRINT "END"
```

This is the same as the following.

```
10 LPRINT CHR$(27);"K";CHR$(0);CHR$(1);
20 FOR I=1 TO 256: LPRINT "x";:NEXT
30 LPRINT "END"
```

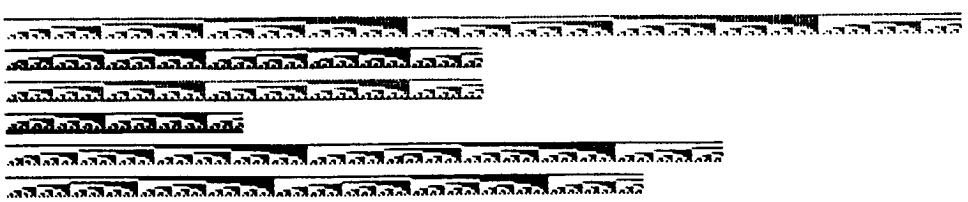
See also ESC K, ESC L, ESC Y and ESC Z

Example 1

```
10 'Bit Image Mode Selection
20 FOR I=0 TO 6
30 IF I=5 GOTO 110
40 LPRINT CHR$(27);"*";CHR$(I);CHR$(12);CHR$(0);
50 FOR J=1 TO 12
60 READ R
70 LPRINT CHR$(R);
80 NEXT J
90 DATA 1,3,7,15,31,63,63,31,15,7,3,1
100 RESTORE
110 NEXT I
120 END
```

Example 2

```
10 'Bit Image Mode Selection
15 D=300
20 FOR I=0 TO 6
30 IF I=5 GOTO 90
40 LPRINT CHR$(27);"*";CHR$(I);
50 LPRINT CHR$(D MOD 256);CHR$(INT(D/256));
60 FOR J=0 TO D
70 LPRINT CHR$(J MOD 128+128);
80 NEXT J
90 LPRINT
100 NEXT I
110 END
```



Chapter 4 MAINTENANCE

4.1 Preventive Maintenance

Preventive maintenance for the RX printer consists basically of cleaning. The printer should be cleaned with a soft brush to remove paper dust and particles after every three months of use. The exterior surface of the printer can be cleaned by using a mild detergent and water solution.

NOTE:

Do not use hard cloth or volatile solvents such as thinner or alcohol when cleaning around the print head. Otherwise, printed characters may not be impressed on the paper or may become dim, or a break may occur in the printed character.

4.2 Parts Replacement

(1) General

Owing to the sophisticated nature of the circuitry and mechanisms utilized in the printer, operator's troubleshooting is logically obliged to be limited to certain easily recognizable symptoms and cures.

If a printer malfunction other than the print head unit should occur, the operator should contact the store from which the printer was purchased.

(2) Print head

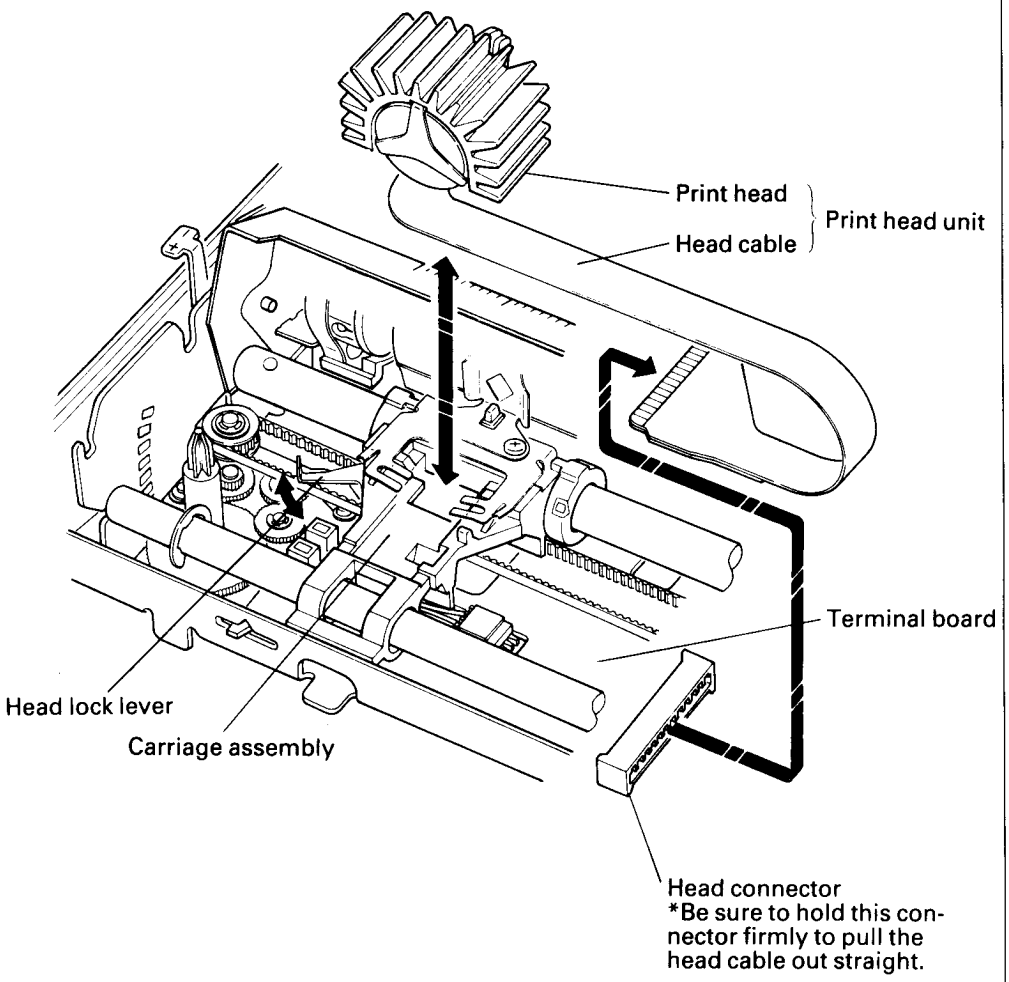
In case of a print head trouble or a worn dot wire, replace the print head unit as described below. (See figure on the next page.)

NOTE:

Be sure to replace the print head after it has cooled.

1. *Disconnect the power cord from the AC outlet.*
2. *Take off the printer cover and cartridge ribbon.*
3. *Turn the head lock lever clockwise and remove the print head.*
4. *Pull the head cable out straight while steadying the head connector on the terminal board.*
5. *Put a new head on the carriage assembly and replace the head lock lever.*

6. Insert the head cable into the head connector carefully.
   NOTES:
   1. *Inadequate connection may cause malfunctioning of the head.*
   2. *The carriage assembly should not be moved without the print head mounted on the carriage.*



Replacement of Print Head

APPENDIXES

A. Specifications

(1) PRINT METHOD : Impact dot matrix
(2) PRINT SPEED : 100 CPS
(3) PRINT DIRECTION : Bidirectional with logic seeking in the text/graphic mode
Unidirectional in the bit image mode or when programmed.
(4) NUMBER OF PINS IN HEAD : 9
(5) LINE SPACING : 1/6" or programmable
(6) PRINTING CHARACTERISTICS
Matrix : 9×9
6×8 Graphic Characters (such as used in the EPSON PORTABLE COMPUTER HX-20)
Character Set : ASCII 96 Characters, 11 International Character Sets, 96 Alternate Characters and 32 Graphic Characters
(7) CHARACTER SIZE
: 2.1 mm (W)×3.1 mm (H) (Pica-sized)
: 2.1 mm (W)×3.1 mm (H) (Emphasized)
: 1.05 mm (W)×3.1 mm (H) (Pica-sized Condensed)
: 4.2 mm (W)×3.1 mm (H) (Pica-sized Enlarged)
: 4.2 mm (W)×3.1 mm (H) (Emphasized Enlarged)
: 2.1 mm (W)×3.1 mm (H) (Condensed Enlarged)
: 1.5 mm (W)×3.1 mm (H) (Elite-sized)
: 3.0 mm (W)×3.1 mm (H) (Elite-sized Enlarged)
: 1.6 mm (H) (Super/Subscript)
(8) COLUMN WIDTH

		Maximum characters per line
Pica-sized/Emphasized	:	80
Enlarged	:	40
Condensed	:	137
Condensed Enlarged	:	68
Elite-sized	:	96
Elite-sized Enlarged	:	48

(9) MEDIA HANDLING

Pin-feed Paper	: Paper Width 4″ to 10″ (101.6 mm to 254 mm)	Paper Feed Tractor Feed
Roll Paper (RX-80 F/T)	: 8.5″ (215.9 mm)	Friction Feed
Cut Sheet (RX-80 F/T)	: 8.3″ to 8.5″ (210 mm to 216 mm)	Friction Feed
Copies	: One original plus two carbon copies (total thickness not to exceed 0.3 mm (0.012″)	
Paper Path	: Rear	

(10) INTERFACES

Standard	: Centronics-style 8-bit Parallel
Optional	: RS-232C, IEEE 488, etc.

(11) INK RIBBON

Color	: Black
Type	: Exclusive cartridge
Life Expectancy	: 3 million characters

(12) MTBF : 5×10^6 lines (excluding print head)

(13) ENVIRONMENTAL CONDITIONS

Temperature	: 5 to 35°C (41 to 95°F)
Humidity	: 10 to 80% (No condensation)

(14) POWER REQUIREMENT

Voltage	: AC 120V±10% AC 220/240V±10%
Frequency	: 49.5 to 60.5 Hz
Power Consumption	: 70 VA maximum

(15) PHYSICAL CHARACTERISTICS

		RX-80	RX-80 F/T
Height	:	107 mm	134 mm
Width (without Paper Feed Knob)	:	372 mm	372 mm
Depth	:	303 mm	303 mm
Weight	:	5.1 kg	6.1 kg

Specifications subject to change without notice.

B. Parallel Interface

The RX printer includes as standard equipment a parallel interface, which is described below.

(1) Specifications

(a) Synchronization: By externally supplied $\overline{\text{STROBE}}$ pulses.
(b) Handshaking: By $\overline{\text{ACKNLG}}$ or BUSY signals.
(c) Logic level: Input data and all interface control signals are compatible with the TTL level. (Compatible with CENTRONICS-type 8 bits parallel)

(2) Connector

Plug: 57-30360 (AMPHENOL)
It is recommended that interface cables be kept as short as possible.

(3) Connector pin assignment and descriptions of signals.

Connector pin assignment and descriptions of respective interface signals are provided in Table B-1.

Table B-1 Connector Pin Assignment and Descriptions of Interface Signals

Signal Pin No.	Return Pin No.	Signal	Direction	Description
1	19	$\overline{\text{STROBE}}$	In	$\overline{\text{STROBE}}$ pulse to read data in. Pulse width must be more than 0.5 μs at receiving terminal.
2	20	DATA 1	In	These signals represent the 1st to 8th bits of parallel data respectively. Each signal is at "HIGH" level when data is logical "1" and "LOW" when logical "0".
3	21	DATA 2	In	
4	22	DATA 3	In	
5	23	DATA 4	In	
6	24	DATA 5	In	
7	25	DATA 6	In	
8	26	DATA 7	In	
9	27	DATA 8	In	
10	28	$\overline{\text{ACKNLG}}$	Out	Approx. 12 μs pulse. "LOW" indicates that data has been received and that the printer is ready to accept other data.
11	29	BUSY	Out	A "HIGH" signal indicates that the printer cannot receive data. The signal becomes "HIGH" in the following cases: 1. During data entry 2. During printing operation 3. In OFF-LINE state 4. During printer error status.

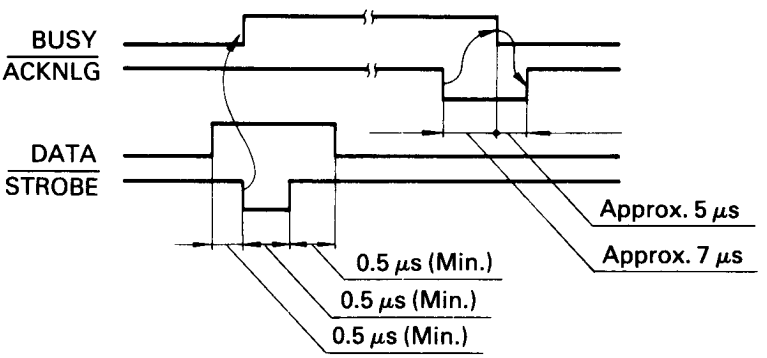
Signal Pin No.	Return Pin No.	Signal	Direction	Description
12	30	PE	Out	A "HIGH" signal indicates that the printer is out of paper.
13	—	—	—	Pulled up to +5V through 3.3 kΩ resistance
14	—	$\overline{\text{AUTO FEED XT}}$	In	With this signal being at "LOW" level, the paper is automatically fed one line after printing. (The signal level can be fixed to "LOW" by setting DIP SW pin 2-3 provided on the control circuit board.)
15	—	NC	—	Not used.
16	—	0V	—	Logic GND level.
17	—	CHASSIS GND	—	Printer chassis GND. In the printer, the chassis GND and the logic GND are isolated from each other.
18	—	NC	—	Not used.
19 to 30	—	GND	—	TWISTED-PAIR RETURN signal GND level.
31	—	INIT	In	When the level of this signal becomes "LOW", the printer controller is reset to its initial state and the print buffer is cleared. This signal is normally at "HIGH" level, and its pulse width must be more than 50 μs at the receiving terminal.
32	—	$\overline{\text{ERROR}}$	Out	The level of this signal becomes "LOW" when the printer is in— 1. PAPER-END state 2. OFF-LINE state 3. Error state
33	—	GND	—	Same as for Pin Nos. 19 to 30.
34	—	NC	—	Not used.
35	—	—	—	Pulled up to +5V through 3.3 kΩ resistance.
36	—	$\overline{\text{SLCT IN}}$	In	Data entry to the printer is possible only when the level of this signal is "LOW". (Internal fixing can be carried out with DIP SW pin 2-2. Factory-set to "LOW" at time of delivery.

NOTES:

1. *"Direction" refers to the direction of signal flow as viewed from the printer.*
2. *"Return" denotes "TWISTED PAIR RETURN" and is to be connected at signal ground level.*
   As to the wiring for the interface, be sure to use a twisted-pair cable for each signal and never fail to complete connection on the Return side. To prevent noise effectively, these cables should be shielded and connected to the chassis of the host computer and the printer, respectively.
3. *All interface conditions are based on TTL level. Both the rise and fall times of each signal must be less than 0.2 μs.*
4. *Data transfer must not be carried out by ignoring the $\overline{ACKNLG}$ or BUSY signal. (Data transfer to this printer can be carried out only after confirming the $\overline{ACKNLG}$ signal or when the level of the BUSY signal is "LOW".)*
5. *Under normal conditions, printer cable pins 11, 12 and 32 are activated when out of paper is detected.*
   ESC 8 code disable pins 11 and 32 from the PE (Paper-End) signal, but it does not disable pin 12.
   Although most computers do not monitor pin 12, those which do (e.g. TRS-80) will halt printing when the paper is out. Therefore, ESC 8 code is ineffective with these computers.

(4) Data transfer sequence

1) Interface timing



Parallel Interface Timing

2) Relations among ON-LINE, $\overline{\text{SLCT IN}}$ and Interface Signals
The following table shows how data entry is processed in ON or OFF-LINE switch position and $\overline{\text{SLCT IN}}$ (input signal), and $\overline{\text{ERROR}}$, BUSY, $\overline{\text{ACKNLG}}$ and $\overline{\text{SLCT IN}}$ (output signal) are shown.

Relations among ON-LINE, $\overline{\text{SLCT IN}}$ and Interface Signal

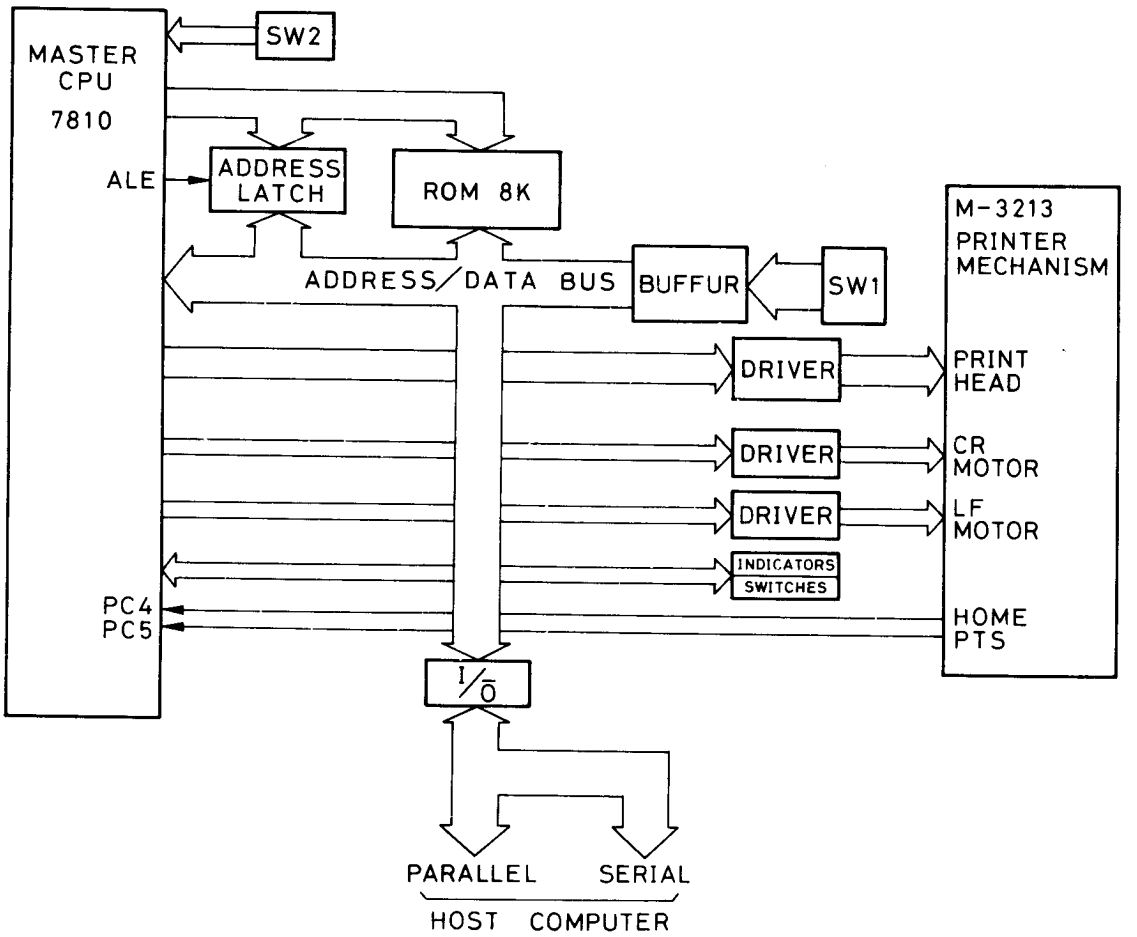
ON-LINE Switch	$\overline{\text{SLCT IN}}$ Signal	$\overline{\text{ERROR}}$	BUSY	$\overline{\text{ACKNLG}}$	DATA ENTRY
OFF-LINE	HIGH/LOW	LOW	HIGH	Not generated	Disable
ON-LINE	HIGH	HIGH	LOW/HIGH	Generated	Enable (See Note 1.)
	LOW	HIGH	LOW/HIGH	Generated	Enable (Normal entry)

NOTES:

1. *When $\overline{\text{SLCT IN}}$ is high level, the data entry is enabled, but input data is ignored until $\overline{\text{SLCT IN}}$ is "LOW" level.*
2. *In the above table, it is assumed that no $\overline{\text{ERROR}}$ status exists other than that attributable to the OFF-LINE mode.*
3. *$\overline{\text{ERROR}}$ status does not necessarily mean $\overline{\text{SLCT IN}}$ status.*

C. Control Circuit Diagram

The control circuit diagram is as shown below.



D. Mixed Use of Printing Modes

In the Table below, ○ denotes that mixed print mode is available.

Mode / Pitch	En-larged	Empha-sized	Super/ Sub-script	Con-densed	Dou-bled	Under lined	Alter-nate	Uni-direc-tional
Pica-sized	○	○	○	○	○	○	○	○
Elite-sized	○	×	○	×	○	○	○	○

Please note that the above are subject to the following conditions.

- × indicates that pitch takes priority and mixed print mode is not available.
- Emphasized mode takes priority over Condensed mode.
- Characters are always double-striked in Superscript/Subscript mode.

E. Character Code Tables (Normal Mode)

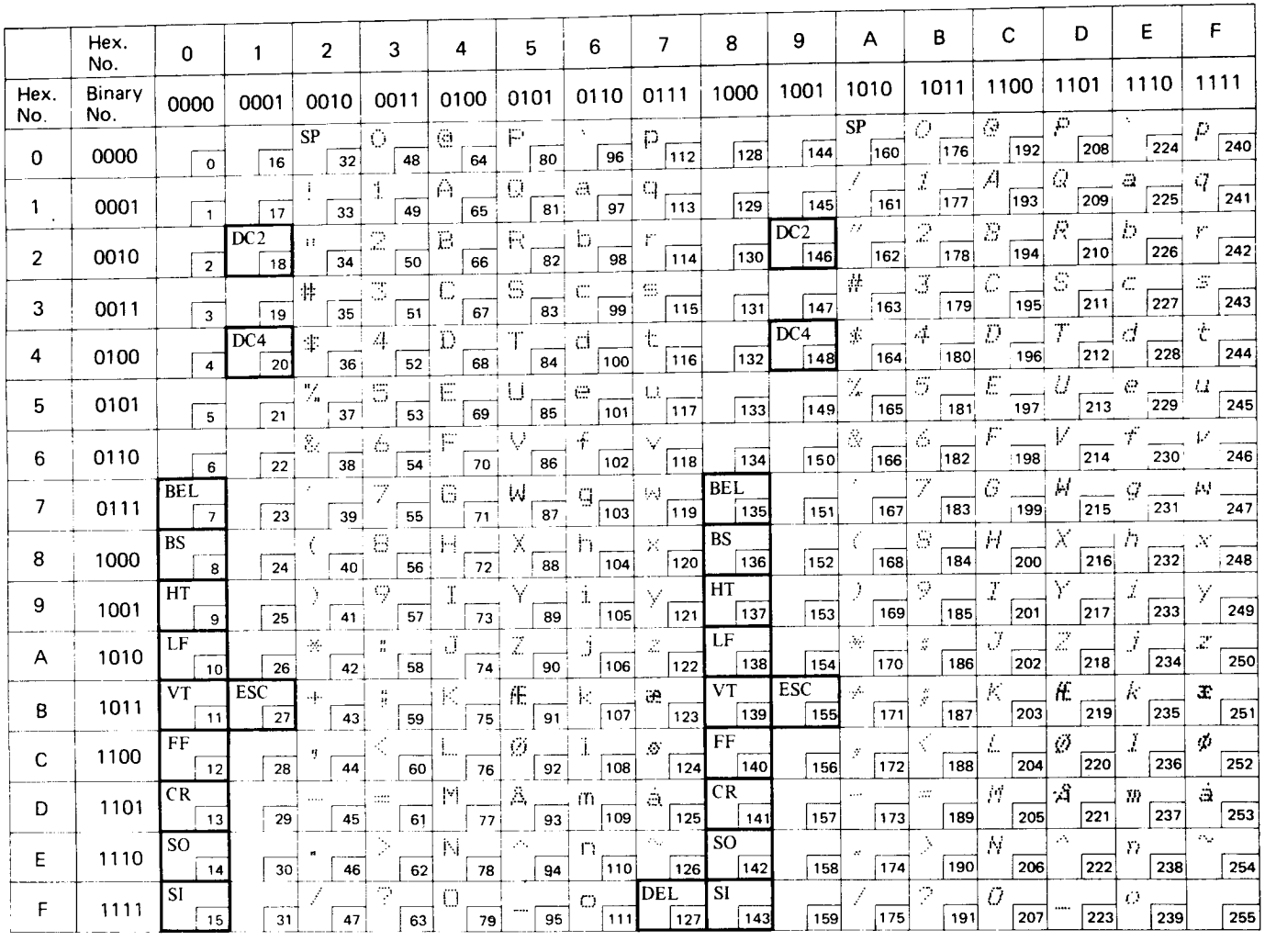
1. U.S.A.

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0 0000	0	16	SP 32	0 48	@ 64	P 80	` 96	p 112	128	144	SP 160	° 176	À 192	Đ 208	à 224	ð 240
1 0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2 0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3 0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4 0100	4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5 0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6 0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7 0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8 1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9 1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A 1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B 1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	VT 139	ESC 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C 1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	| 124	FF 140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D 1101	CR 13	29	- 45	= 61	M 77	] 93	m 109	} 125	CR 141	157	173	½ 189	Í 205	Ý 221	í 237	ý 253
E 1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	SO 142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F 1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Hex. No.	Binary No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	à 64	P 80	` 96	p 112	128	144	SP 160	° 176	à 192	ð 208	` 224	p 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	0100	4	DC4 20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	¢ 123	VT 139	ESC 155	« 171	» 187	Ë 203	Û 219	ë 235	¢ 251
C	1100	FF 12	28	, 44	< 60	L 76	§ 92	l 108	ù 124	FF 140	156	¬ 172	¼ 188	Ì 204	§ 220	ì 236	ù 252
D	1101	CR 13	29	- 45	= 61	M 77	ß 93	m 109	è 125	CR 141	157	173	½ 189	Í 205	ß 221	ï 237	è 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	¨ 126	SO 142	158	® 174	¾ 190	Î 206	^ 222	ñ 238	¨ 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	Ï 207	_ 223	ò 239	255

	Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	§ 64	P 80	` 96	p 112	128	144	SP 160	° 176	§ 192	P 208	` 224	p 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	A 193	Q 209	a 225	q 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	B 194	R 210	b 226	r 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	C 195	S 211	c 227	s 243
4	0100	4	DC4 20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	´ 180	D 196	T 212	d 228	t 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	E 197	U 213	e 229	u 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	F 198	V 214	f 230	v 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	· 183	G 199	W 215	g 231	w 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	¸ 184	H 200	X 216	h 232	x 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	I 201	Y 217	i 233	y 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	J 202	Z 218	j 234	z 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	Ä 91	k 107	ä 123	VT 139	ESC 155	« 171	» 187	K 203	Ä 219	k 235	ä 251
C	1100	FF 12	28	, 44	< 60	L 76	Ö 92	l 108	ö 124	FF 140	156	¬ 172	¼ 188	L 204	Ö 220	l 236	ö 252
D	1101	CR 13	29	- 45	= 61	M 77	Ü 93	m 109	ü 125	CR 141	157	- 173	½ 189	M 205	Ü 221	m 237	ü 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	ß 126	SO 142	158	® 174	¾ 190	N 206	^ 222	n 238	ß 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	O 207	_ 223	o 239	255

	Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	@ 64	P 80	` 96	p 112	128	144	SP 160	° 176	À 192	Ð 208	à 224	ð 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	0011	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	0100	4	DC4 20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	VT 139	ESC 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	| 124	FF 140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	1101	CR 13	29	- 45	= 61	M 77	] 93	m 109	} 125	CR 141	157	173	½ 189	Í 205	Ý 221	í 237	ý 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	SO 142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255


Hex. No.
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A
B
C
D
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F
Hex. No.
Binary No.
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0010
0011
0100
0101
0110
0111
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1010
1011
1100
1101
1110
1111
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0000
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0001
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B
1011
C
1100
D
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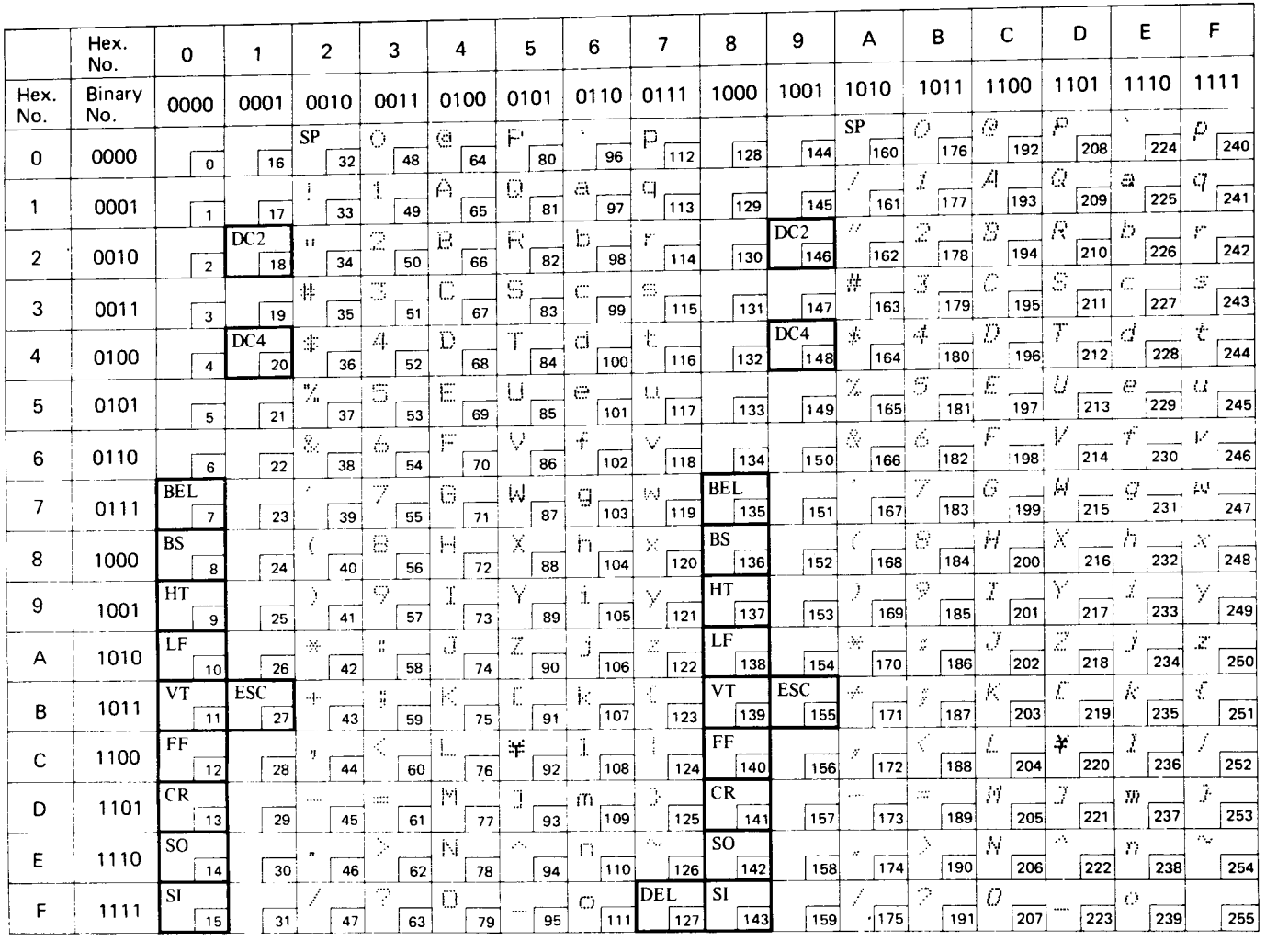
E
1110
F
1111
SP
DC2
DC4
BEL
BS
HT
LF
VT
ESC
FF
CR
SO
SI
DEL

Hex. No.	Binary No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	É 64	P 80	é 96	p 112	128	144	SP 160	Ö 176	É 192	P 208	é 224	p 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	Ä 177	Å 193	Q 209	a 225	q 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	Ü 178	B 194	R 210	b 226	r 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	ü 179	C 195	S 211	c 227	s 243
4	0100	4	DC4 20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	§ 180	D 196	T 212	d 228	t 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	ö 181	E 197	U 213	e 229	u 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	ä 182	F 198	V 214	f 230	v 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	ö 183	G 199	W 215	g 231	w 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	Ö 184	H 200	X 216	h 232	x 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	ä 185	I 201	Y 217	i 233	y 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	ü 186	J 202	Z 218	j 234	z 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	Ä 91	k 107	ä 123	VT 139	ESC 155	« 171	é 187	K 203	Ä 219	k 235	ä 251
C	1100	FF 12	28	, 44	< 60	L 76	Ö 92	l 108	ö 124	FF 140	156	¬ 172	< 188	L 204	Ö 220	l 236	ö 252
D	1101	CR 13	29	- 45	= 61	M 77	Å 93	m 109	å 125	CR 141	157	- 173	= 189	M 205	Å 221	m 237	å 253
E	1110	SO 14	30	. 46	> 62	N 78	Ü 94	n 110	ü 126	SO 142	158	® 174	> 190	N 206	Ü 222	n 238	ü 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	? 191	O 207	_ 223	o 239	255

	Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	@ 64	P 80	ù 96	p 112	128	144	SP 160	° 176	@ 192	P 208	ù 224	p 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	A 193	Q 209	a 225	q 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	B 194	R 210	b 226	r 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	C 195	S 211	c 227	s 243
4	0100	4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	´ 180	D 196	T 212	d 228	t 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	E 197	U 213	e 229	u 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	F 198	V 214	f 230	v 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	· 183	G 199	W 215	g 231	w 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	¸ 184	H 200	X 216	h 232	x 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	I 201	Y 217	i 233	y 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	J 202	Z 218	j 234	z 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	à 123	VT 139	ESC 155	« 171	» 187	K 203	[219	k 235	à 251
C	1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	ò 124	FF 140	156	¬ 172	¼ 188	L 204	\ 220	l 236	ò 252
D	1101	CR 13	29	- 45	= 61	M 77	é 93	m 109	è 125	CR 141	157	- 173	½ 189	M 205	é 221	m 237	è 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	ì 126	SO 142	158	® 174	¾ 190	N 206	^ 222	n 238	ì 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	O 207	_ 223	o 239	255

Hex. No.	Binary No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	@ 64	P 80	` 96	p 112	128	144	SP 160	° 176	À 192	Þ 208	224	þ 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	0011	3	19	₧ 35	3 51	C 67	S 83	c 99	s 115	131	147	₧ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	0100	4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	€ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Š 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	š 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	Œ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	¨ 123	VT 139	ESC 155	« 171	» 187	Ë 203	Û 219	ë 235	¨ 251
C	1100	FF 12	28	, 44	< 60	L 76	Ñ 92	l 108	ñ 124	FF 140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	1101	CR 13	29	- 45	= 61	M 77	] 93	m 109	} 125	CR 141	157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	SO 142	158	® 174	¾ 190	Î 206	Þ 222	î 238	~ 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	255



Hex. No.	Binary No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0000	0	16	SP 32	0 48	@ 64	P 80	` 96	p 112	128	144	SP 160	ｰ 176	ﾀ 192	ﾐ 208	｠ 224	ｰ 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	｡ 161	ｱ 177	ﾁ 193	ﾑ 209	｡ 225	ｱ 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	｢ 162	ｲ 178	ﾂ 194	ﾒ 210	｢ 226	ｲ 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	｣ 163	ｳ 179	ﾃ 195	ﾓ 211	｣ 227	ｳ 243
4	0100	4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	､ 164	ｴ 180	ﾄ 196	ﾔ 212	､ 228	ｴ 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	･ 165	ｵ 181	ﾅ 197	ﾕ 213	･ 229	ｵ 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	ｦ 166	ｶ 182	ﾆ 198	ﾖ 214	ｦ 230	ｶ 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	ｧ 167	ｷ 183	ﾇ 199	ﾗ 215	ｧ 231	ｷ 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	ｨ 168	ｸ 184	ﾈ 200	ﾘ 216	ｨ 232	ｸ 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	ｩ 169	ｹ 185	ﾉ 201	ﾙ 217	ｩ 233	ｹ 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ｪ 170	ｺ 186	ﾊ 202	ﾚ 218	ｪ 234	ｺ 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	VT 139	ESC 155	ｫ 171	ｻ 187	ﾋ 203	ﾛ 219	ｫ 235	ｻ 251
C	1100	FF 12	28	, 44	< 60	L 76	¥ 92	l 108	| 124	FF 140	156	ｬ 172	ｼ 188	ﾌ 204	ﾜ 220	ｬ 236	ｼ 252
D	1101	CR 13	29	- 45	= 61	M 77	] 93	m 109	} 125	CR 141	157	ｭ 173	ｽ 189	ﾍ 205	ﾝ 221	ｭ 237	ｽ 253
E	1110	SO 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	SO 142	158	ｮ 174	ｾ 190	ﾎ 206	ﾞ 222	ｮ 238	ｾ 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	ｯ 175	ｿ 191	ﾏ 207	ﾟ 223	ｯ 239	255

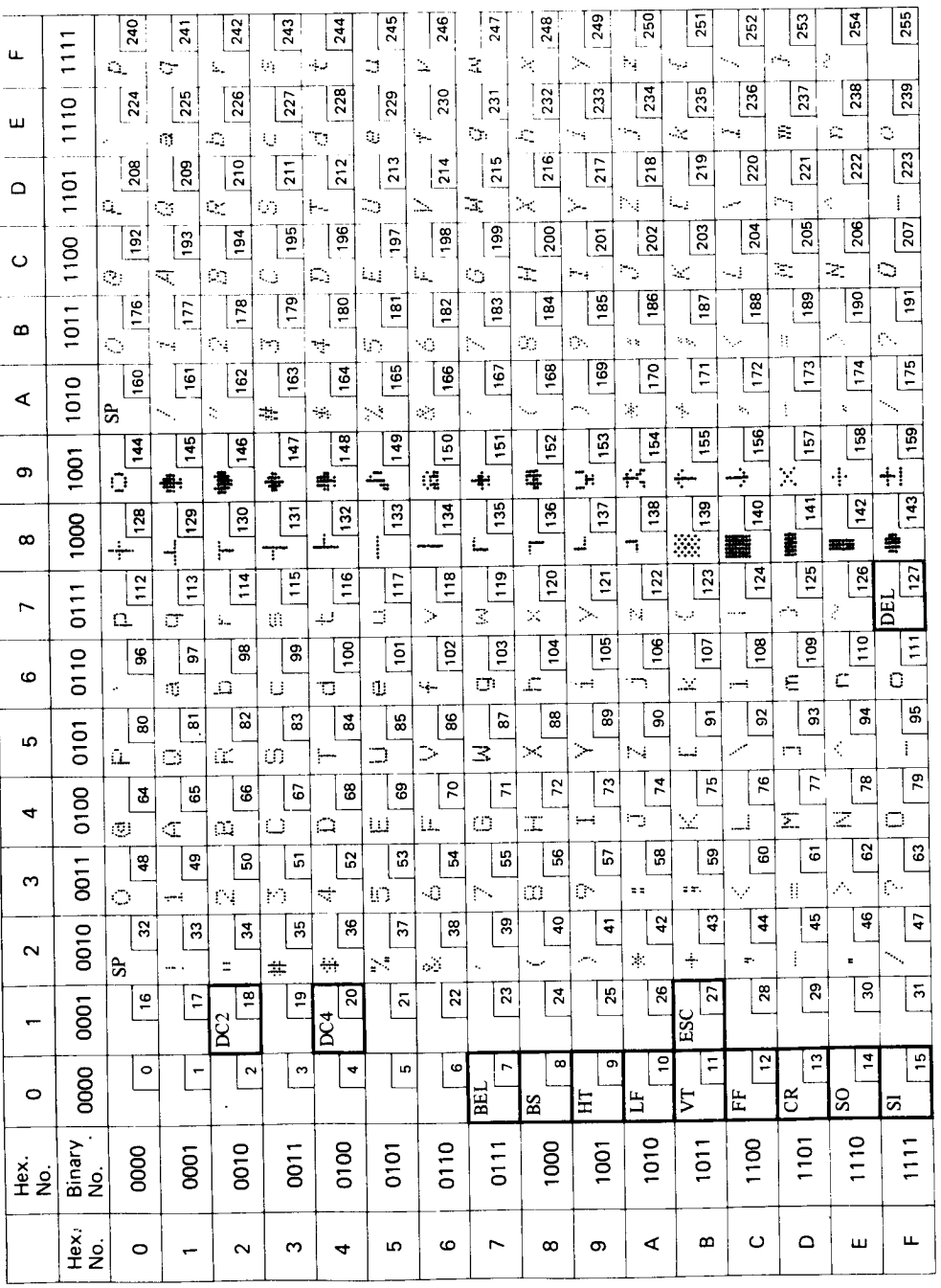
	Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	É 64	P 80	é 96	p 112	128	144	SP 160	176	É 192	P 208	é 224	p 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	177	A 193	Q 209	a 225	q 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	178	B 194	R 210	b 226	r 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	179	C 195	S 211	c 227	s 243
4	0100	4	DC4 20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	180	D 196	T 212	d 228	t 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	181	E 197	U 213	e 229	u 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	182	F 198	V 214	f 230	v 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	183	G 199	W 215	g 231	w 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	184	H 200	X 216	h 232	x 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	185	I 201	Y 217	i 233	y 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	186	J 202	Z 218	j 234	z 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	Æ 91	k 107	æ 123	VT 139	ESC 155	« 171	187	K 203	Æ 219	k 235	æ 251
C	1100	FF 12	28	, 44	< 60	L 76	Ø 92	l 108	ø 124	FF 140	156	¬ 172	188	L 204	Ø 220	l 236	ø 252
D	1101	CR 13	29	- 45	= 61	M 77	Å 93	m 109	å 125	CR 141	157	- 173	189	M 205	Å 221	m 237	å 253
E	1110	SO 14	30	. 46	> 62	N 78	Ü 94	n 110	ü 126	SO 142	158	® 174	190	N 206	Ü 222	n 238	ü 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	191	O 207	_ 223	o 239	255

	Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	0	16	SP 32	0 48	é 64	P 80	é 96	p 112	128	144	SP 160	0 176	É 192	P 208	é 224	p 240
1	0001	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	1 177	A 193	Q 209	a 225	q 241
2	0010	2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	DC2 146	¢ 162	2 178	B 194	R 210	b 226	r 242
3	0011	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	3 179	C 195	S 211	c 227	s 243
4	0100	4	DC4 20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	DC4 148	¤ 164	4 180	D 196	T 212	d 228	t 244
5	0101	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	5 181	E 197	U 213	e 229	u 245
6	0110	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	6 182	F 198	V 214	f 230	v 246
7	0111	BEL 7	23	' 39	7 55	G 71	W 87	g 103	w 119	BEL 135	151	§ 167	7 183	G 199	W 215	g 231	w 247
8	1000	BS 8	24	(40	8 56	H 72	X 88	h 104	x 120	BS 136	152	¨ 168	8 184	H 200	X 216	h 232	x 248
9	1001	HT 9	25	) 41	9 57	I 73	Y 89	i 105	y 121	HT 137	153	© 169	9 185	I 201	Y 217	i 233	y 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	LF 138	154	ª 170	: 186	J 202	Z 218	j 234	z 250
B	1011	VT 11	ESC 27	+ 43	; 59	K 75	Æ 91	k 107	æ 123	VT 139	ESC 155	« 171	; 187	K 203	Æ 219	k 235	æ 251
C	1100	FF 12	28	, 44	< 60	L 76	Ø 92	l 108	ø 124	FF 140	156	¬ 172	< 188	L 204	Ø 220	l 236	ø 252
D	1101	CR 13	29	- 45	= 61	M 77	Å 93	m 109	å 125	CR 141	157	- 173	= 189	M 205	Å 221	m 237	å 253
E	1110	SO 14	30	. 46	> 62	N 78	Ü 94	n 110	ü 126	SO 142	158	® 174	> 190	N 206	Ü 222	n 238	ü 254
F	1111	SI 15	31	/ 47	? 63	O 79	_ 95	o 111	DEL 127	SI 143	159	¯ 175	? 191	O 207	_ 223	o 239	255

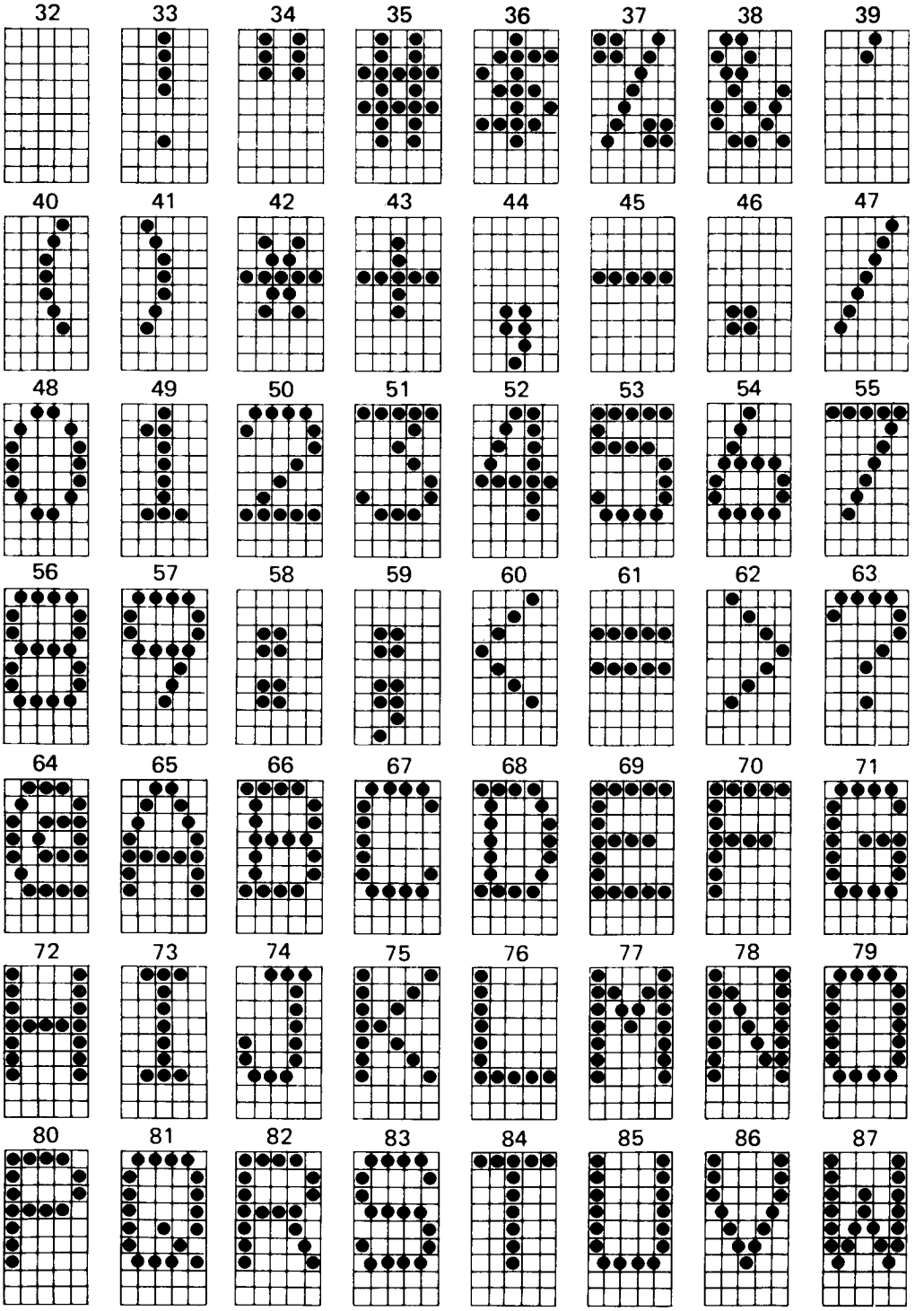
F. Character Code Table (HX-20 Graphic Mode)

Input of ESC m $(4)_D$ causes the printer to select the graphic characters in $(128)_D$ through $(159)_D$ on the control code table.
This also applies to the character sets other than U.S.A.

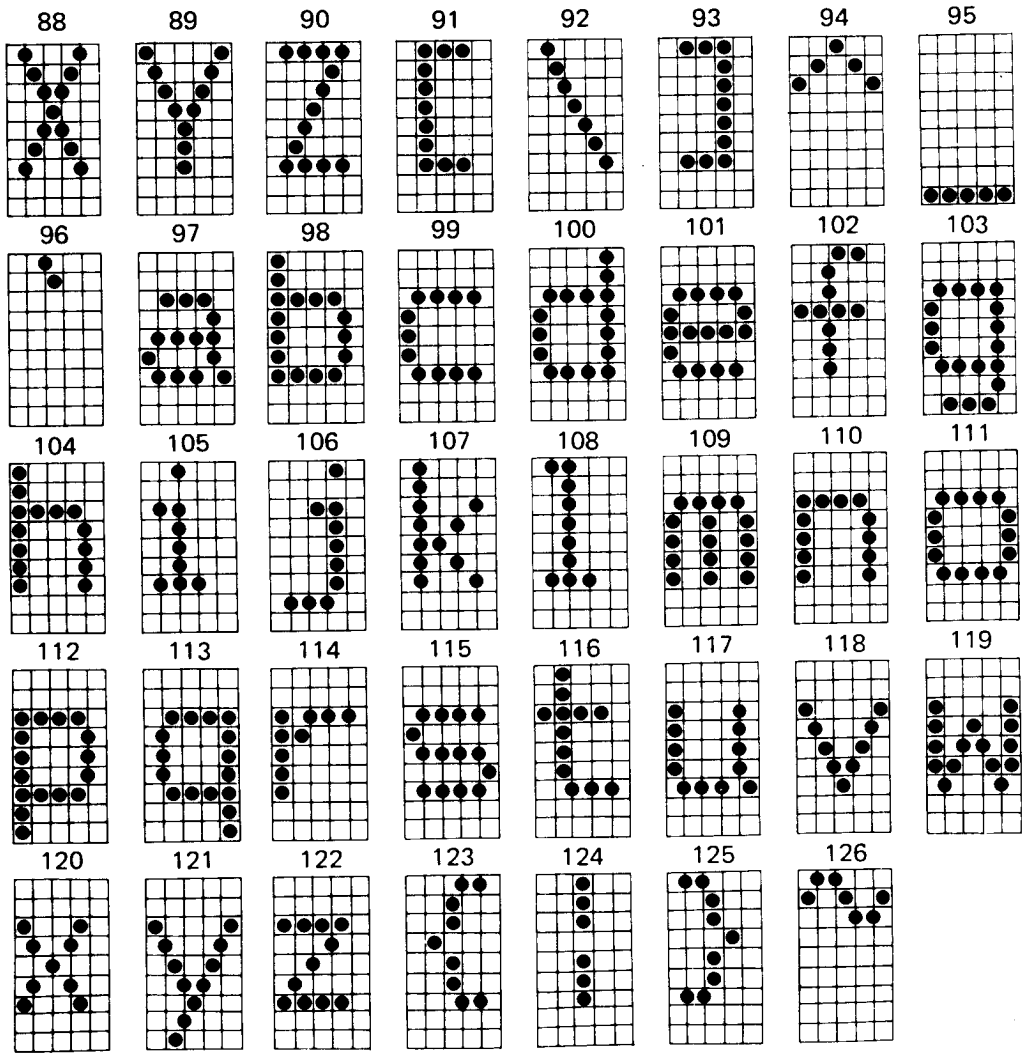
(U.S.A.)



G. Character Fonts



NOTE: Numbers represent Decimal code.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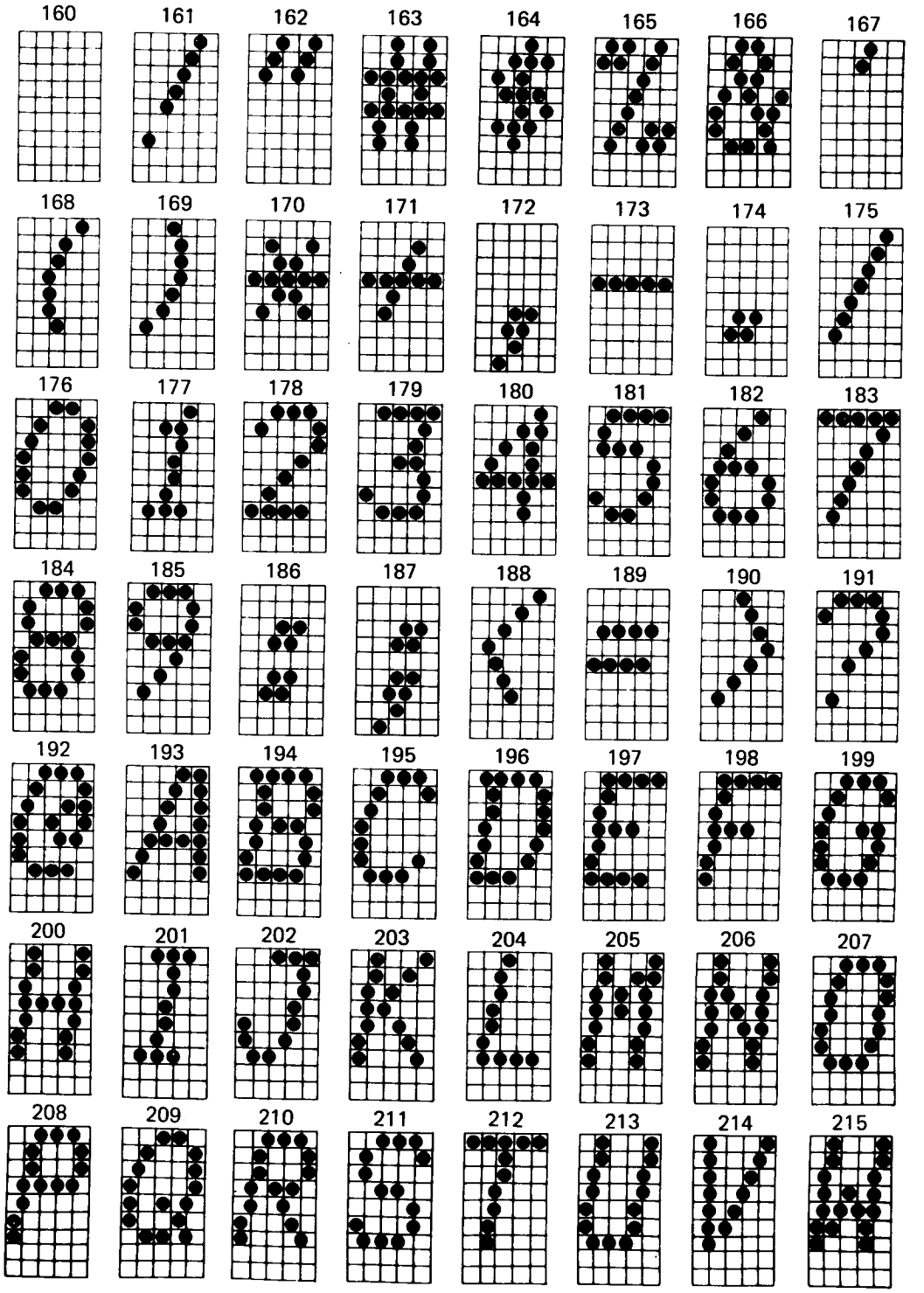
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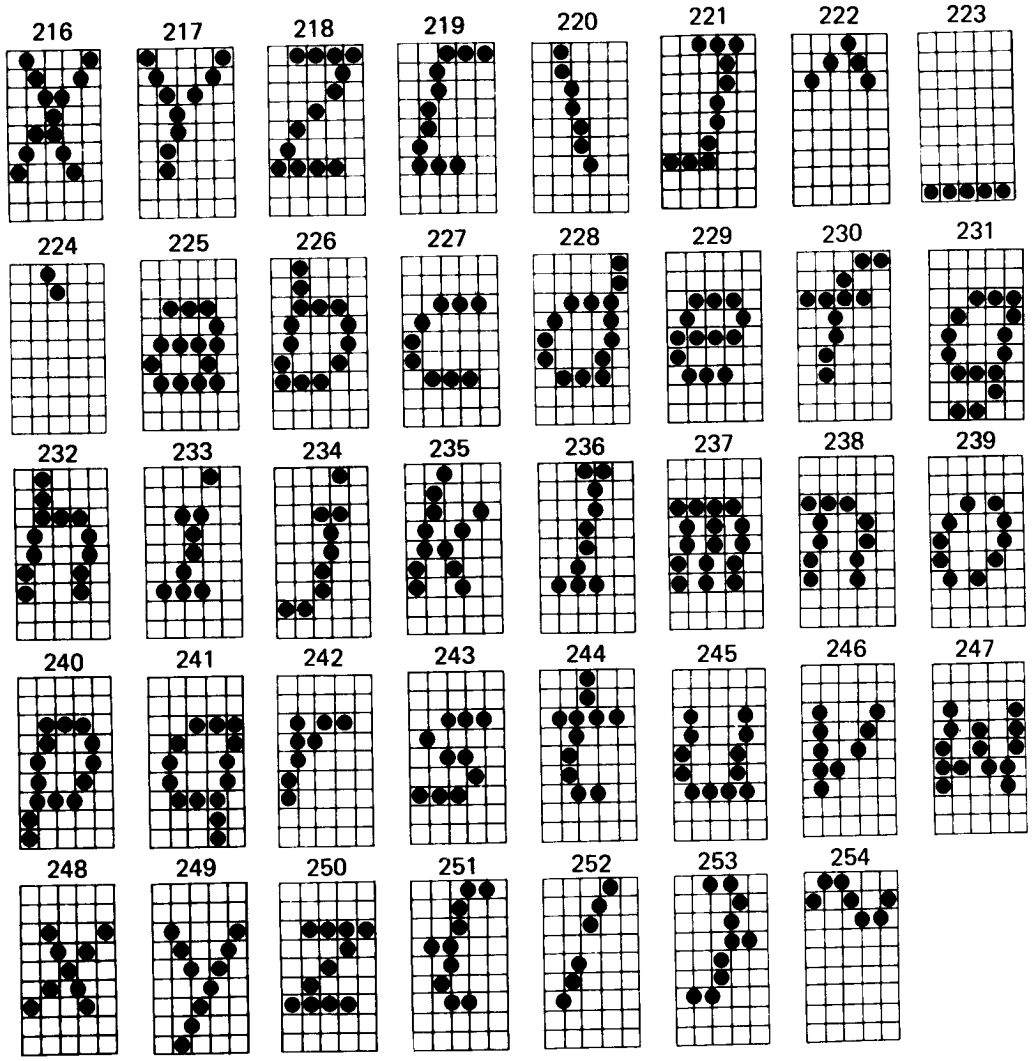
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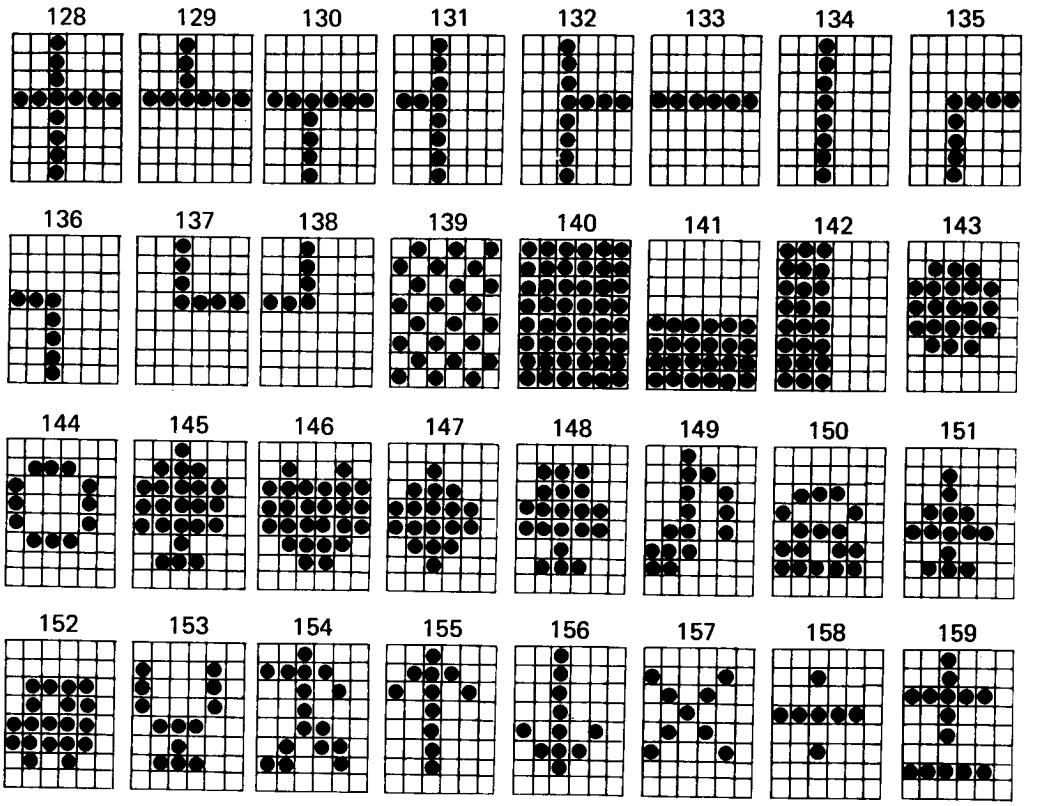
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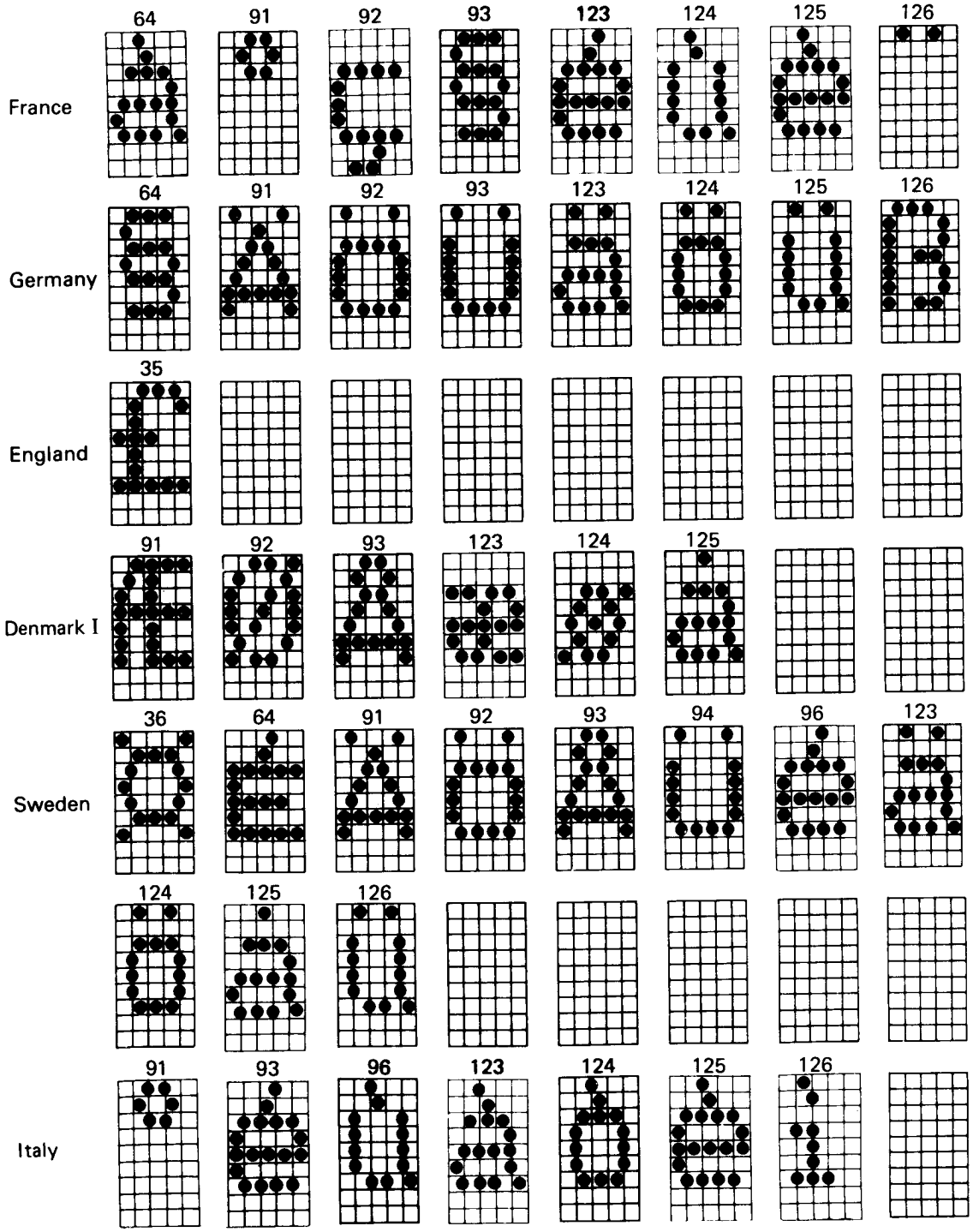
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Germany
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England
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Denmark I
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Sweden
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Italy
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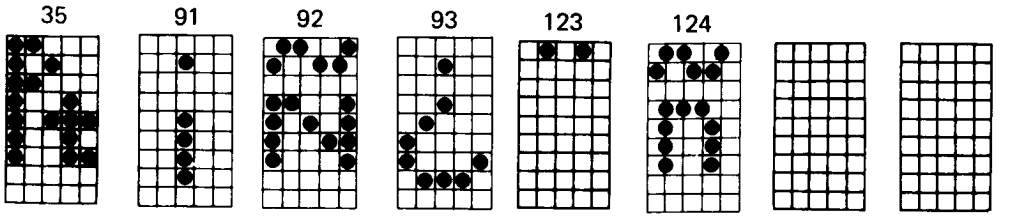
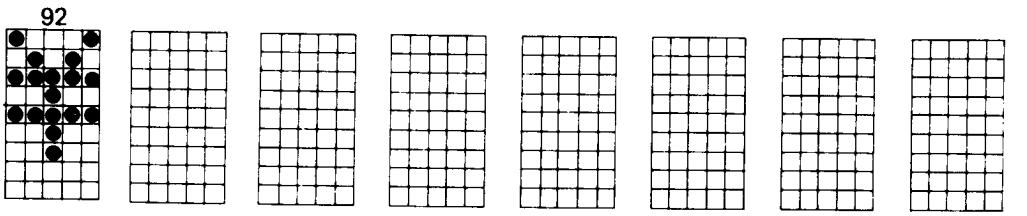
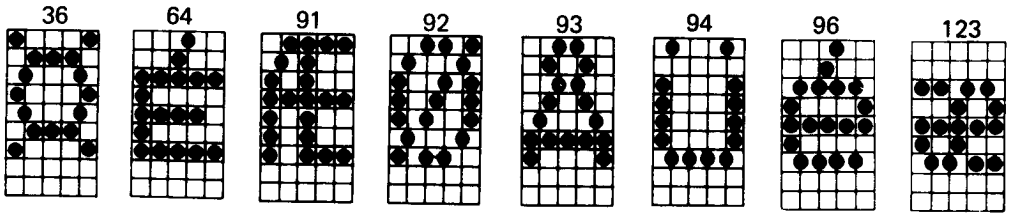
Spain

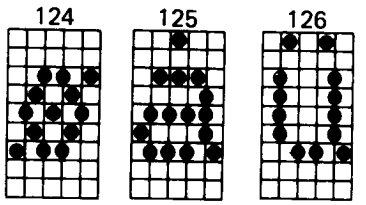


Japan

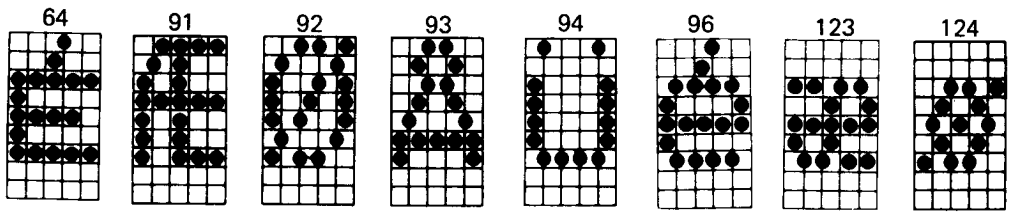


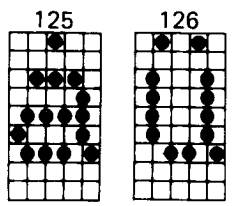
Norway

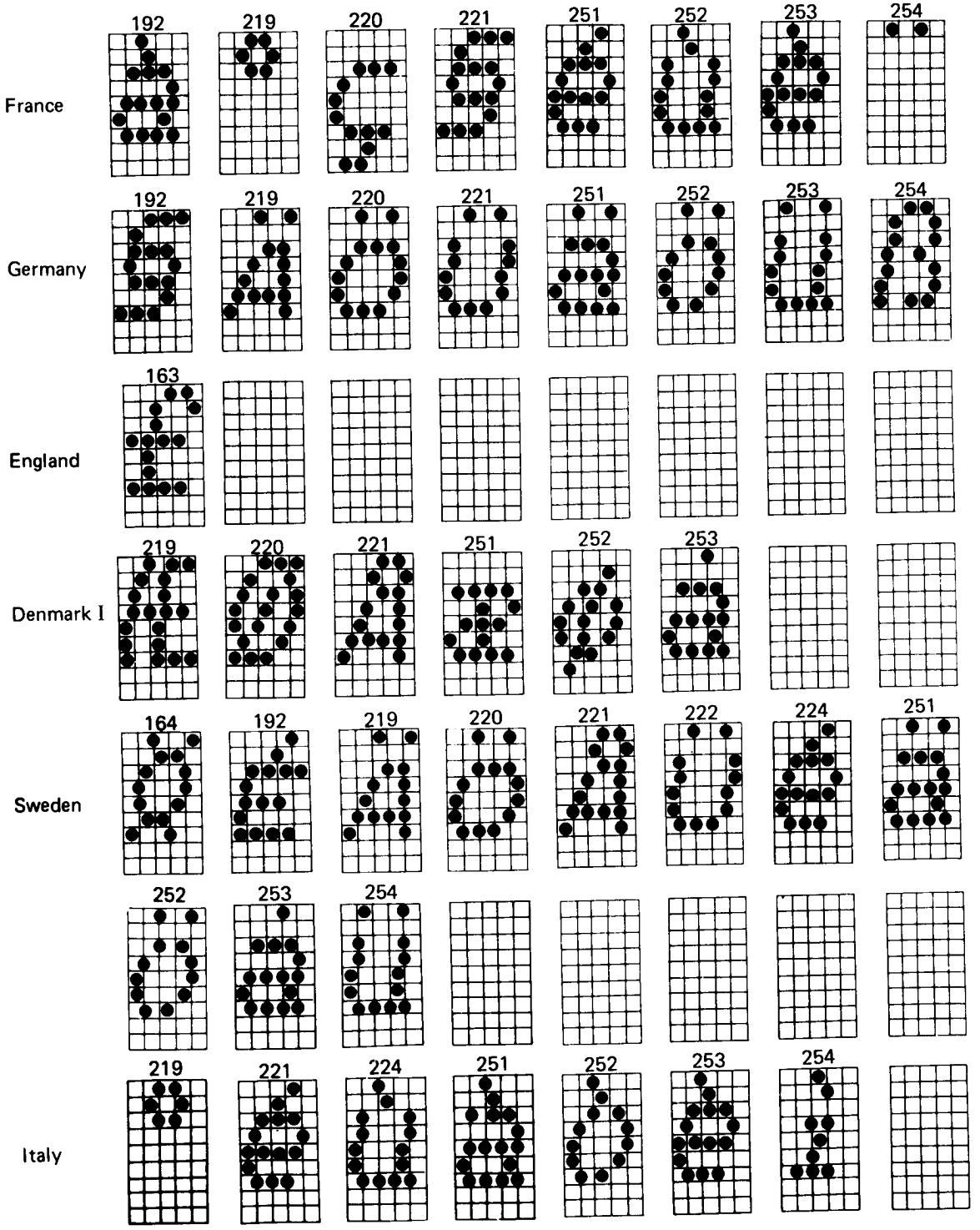




Denmark II






France
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Germany
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England
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Sweden
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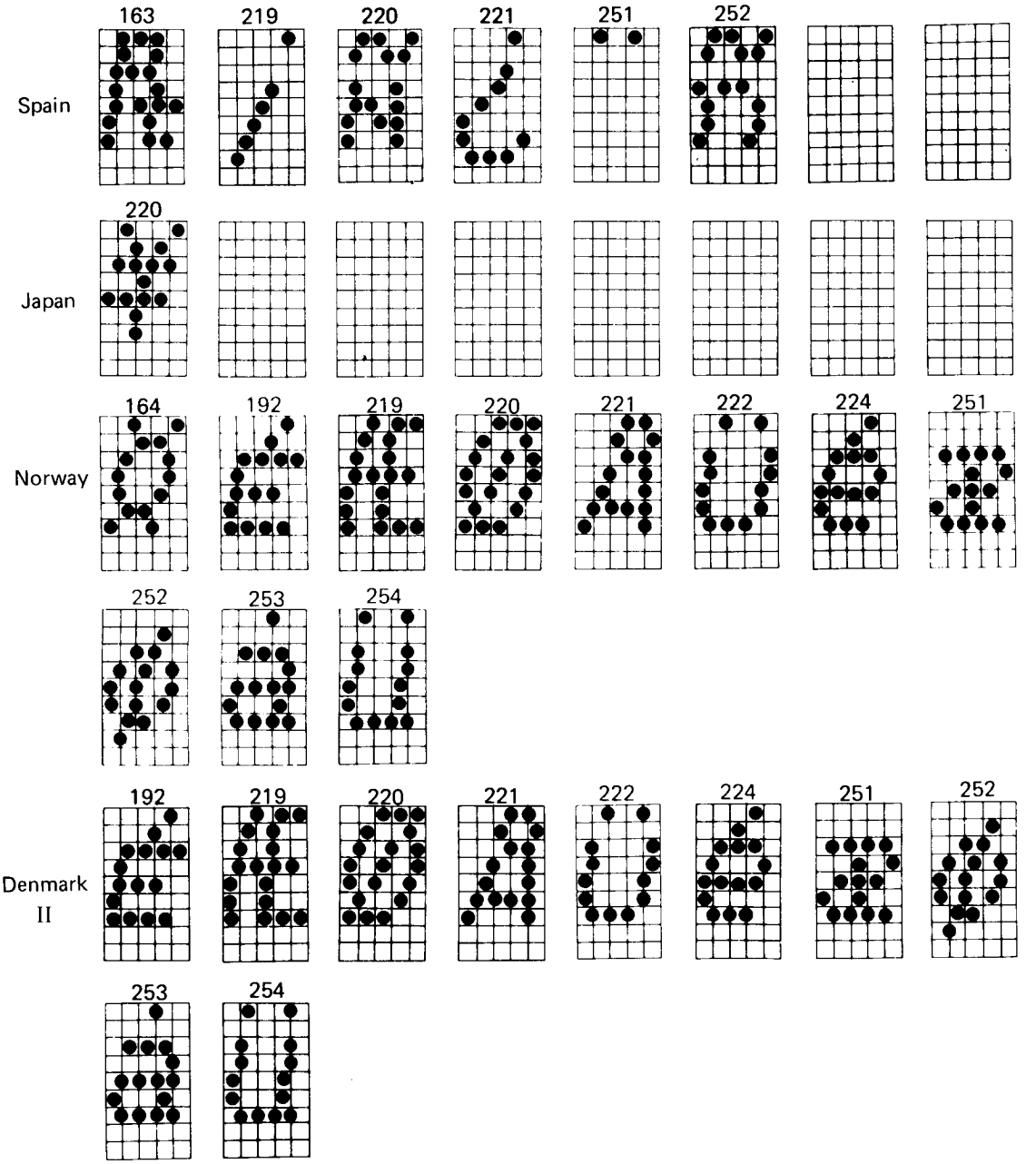
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Norway
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Denmark II
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254

H. Control Codes Summary

Code	Name	Function	Ref. page
Print execution			
CR	Carriage Return	Starts printing.	3-5
LF	Line Feed	Advances paper one line.	3-6
ESC J	Tentative n/216″ Line Spacing	Feeds n/216″ line spacing for one Line.	3-7
FF	Form Feed	Advances paper to next Top of Form.	3-8
Print mode			
ESC M	Elite-sized Character Setting	Sets elite-sized character.	3-9
ESC P	Pica-sized Character Setting	Cancels ESC M code.	3-10
SO	Shift Out	Sets Enlarged print mode.	3-11
DC4	Enlarged Mode Cancel	Cancels Enlarged print mode set by SO code.	3-12
ESC W	Enlarged Mode	Sets/Cancels Enlarged print mode.	3-13
SI	Shift In	Sets Condensed print mode.	3-14
DC2	Condensed Mode Cancel	Cancels Condensed print mode.	3-16
ESC SO	Shift Out	Same as SO code.	3-17
ESC SI	Shift In	Same as SI code.	3-17
ESC –	Underlined Mode	Sets/Cancels Underlined print mode.	3-18
ESC E	Emphasized Mode Setting	Sets Emphasized print mode.	3-19
ESC F	Emphasized Mode Cancel	Cancels Emphasized print mode.	3-20
ESC G	Double-strike Mode Setting	Sets Double-strike print mode.	3-21
ESC H	Double-strike Mode Cancel	Cancels Double-strike print mode.	3-21
ESC S	Superscript/Subscript Mode Setting	Sets Superscript/Subscript print mode.	3-22
ESC T	Superscript/Subscript Mode Cancel	Cancels Superscript/Subscript print mode.	3-24
BS	Backspace	Prints and backs by one character.	3-25

Code	Name	Function	Ref. page
Selection of character set			
ESC 4	Alternate Character Set Selection	Selects alternate character set.	3-26
ESC 5	Alternate Character Set Cancel	Cancels alternate character set.	3-26
ESC R	International Character Set Selection	Selects international character set.	3-29
ESC m	Special CG Selection	Selects special CG. (Character Generator)	3-31
Line spacing			
ESC 0	1/8″ Line Spacing	Sets 1/8″ line spacing.	3-32
ESC 1	7/72″ Line Spacing	Sets 7/72″ line spacing.	3-33
ESC 2	1/6″ Line Spacing	Sets 1/6″ line spacing.	3-34
ESC 3	n/216″ Line Spacing	Sets n/216″ line spacing.	3-35
ESC A	n/72″ Line Spacing	Sets n/72″ line spacing.	3-36
Format control			
HT	Horizontal TAB	Horizontal Tabulation	3-37
VT	Vertical TAB	Vertical Tabulation	3-38
ESC e	TAB Unit Setting	Sets horizontal/vertical TAB unit.	3-39
ESC f	Skip Position Setting	Sets horizontal/vertical skip position.	3-42
ESC C	Form Length Setting	Sets form length.	3-43
ESC N	Skip-over Perforation Setting	Sets skip-over perforation.	3-44
ESC O	Skip-over Perforation Cancel	Cancels skip-over perforation.	3-45
ESC Q	Right Margin	Sets column end.	3-46
ESC l	Left Margin	Sets column head.	3-47
Input data control			
DEL	Delete	Cancels last printable data.	3-49

Code	Name	Function	Ref. page
Miscellaneous			
BEL	Bell	Sounds the buzzer.	3-50
ESC 8	Paper-end Detector Ignore	Ignores paper-end signal.	3-51
ESC 9	Paper-end Detector Enable	Enables paper-end signal.	3-51
ESC <	One line unidirectional printing	Prints current line only from left to right.	3-52
ESC @	Printer Initialization	Initializes the printer.	3-53
ESC U	Unidirectional Printing	Sets/Cancels unidirectional printing.	3-54
ESC s	Half Speed Printing	Sets/Cancels half speed printing.	3-55
Bit image			
ESC K	Normal-density bit image mode	Sets Normal-density bit image mode.	3-57
ESC L	Dual-density bit image mode	Sets Dual-density bit image mode.	3-63
ESC Y	Double-speed Dual-density Bit Image Mode	Sets Double-speed dual-density bit image mode.	3-66
ESC Z	Quadruple-density Bit Image Mode	Sets Quadruple-density bit image mode.	3-66
ESC *	Bit Image Mode Selection	Selects Bit image mode.	3-67
Non-command sequence			
Self-Test	Power ON while holding down LF.		2-4
Hex. Dump	Power ON while holding down LF and FF.		3-3

NOTES:

1. *When the printer is connected to the TRS-80 computer, statements CHR$(0), CHR$(10), CHR$(11) and CHR$(12) are not applicable.*
2. *When using the printer connected to the APPLE II computer.*

   To select the printer.....PR#1
   To deselect the printer.....PR#0

Index by Character Code

	Code			Function	Ref. page
	Dec	Hex	Symbol		
	7	07	BEL	Sounds the buzzer.	3-50
	8	08	BS	Prints and backs by one character.	3-25
	9	09	HT	Horizontal Tabulation	3-37
	10	0A	LF	Advances paper one line.	3-6
	11	0B	VT	Vertical Tabulation	3-38
	12	0C	FF	Advances paper to next Top of Form.	3-8
	13	0D	CR	Starts printing.	3-5
	14	0E	SO	Sets Enlarged print mode.	3-11
	15	0F	SI	Sets Condensed print mode.	3-14
	18	12	DC2	Cancels Condensed print mode.	3-16
	20	14	DC4	Cancels Enlarged print mode set by SO code.	3-12
	27	1B	ESC	Escape. ASCII code for Escape. Precedes numbers and alphabets etc.	3-2
<ESC>	14	0E	SO	Same as SO code.	3-17
<ESC>	15	0F	SI	Same as SI code.	3-17
<ESC>	42	2A	*	Selects Bit image mode.	3-67
<ESC>	45	2D	–	Sets/Cancels Underlined print mode.	3-18
<ESC>	48	30	0	Sets 1/8″ line spacing.	3-32
<ESC>	49	31	1	Sets 7/72″ line spacing.	3-33
<ESC>	50	32	2	Sets 1/6″ line spacing.	3-34
<ESC>	51	33	3	Sets n/216″ line spacing.	3-35
<ESC>	52	34	4	Selects alternate character set.	3-26
<ESC>	53	35	5	Cancels alternate character set.	3-26
<ESC>	56	38	8	Ignores paper-end signal.	3-51
<ESC>	57	39	9	Enables paper-end signal.	3-51
<ESC>	60	3C	<	Prints current line only from left to right.	3-52
<ESC>	64	40	@	Initializes the printer.	3-53
<ESC>	65	41	A	Sets n/72″ line spacing.	3-36
<ESC>	67	43	C	Sets form length.	3-43
<ESC>	69	45	E	Sets Emphasized print mode.	3-19
<ESC>	70	46	F	Cancels Emphasized print mode.	3-20
<ESC>	71	47	G	Sets Double-strike print mode.	3-21
<ESC>	72	48	H	Cancels Double-strike print mode.	3-21
<ESC>	74	4A	J	Feeds n/216″ line spacing for one line.	3-7
<ESC>	75	4B	K	Sets Normal-density bit image mode.	3-57
<ESC>	76	4C	L	Sets Dual-density bit image mode.	3-63
<ESC>	77	4D	M	Sets elite-sized character.	3-9
<ESC>	78	4E	N	Sets skip-over perforation.	3-44
<ESC>	79	4F	O	Cancels skip-over perforation.	3-45
<ESC>	80	50	P	Cancels ESC M code.	3-10
<ESC>	81	51	Q	Sets column end.	3-46
<ESC>	82	52	R	Selects international character set.	3-29
<ESC>	83	53	S	Sets Superscript/Subscript print mode.	3-22
<ESC>	84	54	T	Cancels Superscript/Subscript print mode.	3-24
<ESC>	85	55	U	Sets/Cancels unidirectional printing.	3-54
<ESC>	87	57	W	Sets/Cancels Enlarged print mode.	3-13
<ESC>	89	59	Y	Sets Double-speed dual-density bit image mode.	3-66
<ESC>	90	5A	Z	Sets Quadruple-density bit image mode.	3-66
<ESC>	101	65	e	Sets horizontal/vertical TAB unit.	3-39
<ESC>	102	66	f	Sets horizontal/vertical skip position	3-42
<ESC>	108	6C	l	Sets column head.	3-47
<ESC>	109	6D	m	Selects special CG. (Character Generator)	3-31
<ESC>	115	73	s	Sets/Cancels half speed printing.	3-55
	127	7F	DEL	Cancels last printable data.	3-49

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE
STATEMENT

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

..... reorient the receiving antenna
..... relocate the computer with respect to the receiver
..... move the computer away from the receiver
..... plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.
The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems."
This booklet is available from the US Government Printing Office Washington, D.C., 20402, Stock No. 004-000-00345-4."

This statement will be applied only for the printers marketed in the U.S.A.

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